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ABSTRACT

This report presents a first year evaluation of the Computer Assisted Instruction (CAI)/ Cooperative Learning Project, a 3-year collaborative effort by two Pennsylvania school districts--the Pittston Area School District and the Hatboro-Horsham School District--and Research for Better Schools (RBS). The project proposed to integrate advanced integrated learning system technology with cooperative teaching in the classroom and collaborative learning in the home. The integrated learning system included inquiry-based, hypermedia learning and cooperative learning techniques. It was anticipated that the project could potentially serve as a model for effective CAI that could be nationally validated, disseminated, and adopted by school districts across the nation. The project was to include the acquisition of computer hardware and software, initial and on-going teacher training, achievement and attitudinal data collection and analysis, and dissemination. The evaluation of the study was designed to determine the extent to which the program: (1) enhances mathematics and language arts achievement for the students; (2) produces an increase in time-on-task behavior for the students; (3) enhances student and parent attitudes toward learning, the school, and education in general; and (4) enhances positive teacher and administrator attitudes toward the integrated learning system and cooperative learning. Data for the first year evaluation were gathered via administrator, teacher, and parent questionnaires; however, a pretest-posttest control group design will be used for years 2 and 3 to enhance the validity of the findings. The introductory section of the report provides background information on the project and the evaluation questions addressed by the study. Later sections describe the evaluation design and procedures, preliminary findings, and some conclusions and implications based on these findings. Appended copies of the questionnaires for each of the three groups include tallies of the responses. (DB)

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Introduction

This report represents a first-year evaluation of the "CAI/Cooperative Learning Project." The three-year project is a collaborative effort by two Pennsylvania school districts, the Pittston Area School District and the Hatboro-Horsham School District, and Research for Better Schools (RBS). It is federally supported by an Innovation in Education Program Grant.

The introductory section of the report provides some background information on the project and the evaluation questions addressed by the study; later sections of the report describe the evaluation design and procedures, preliminary findings, and some conclusions and implications based on these findings.

Background

Both the Pittston and Hatboro-Horsham School Districts had previously been involved in successful efforts to implement computer-assisted instructional technology. In order to further adopt this technology, in combination with innovative educational practices, the two districts jointly proposed this collaborative project, under the Fund for Innovation in Education. Specifically, the project proposed to integrate advanced integrated learning system (ILS) technology with cooperative teaching in the classroom and collaborative learning in the home. It was anticipated that the project could potentially serve as a model for effective computer-assisted instruction that could be nationally validated, disseminated, and adopted by school districts across the nation. To realize this potential, the project needed a sound evaluation plan capable of demonstrating the full extent of its effectiveness. Because of its history in evaluating computer-assisted instructional programs, RBS was invited to

collaborate with the two districts in the project, serving as a third-party evaluator.

The project was to include the acquisition of computer hardware and software, initial and on-going teacher training, achievement and attitudinal data collection and analysis, and dissemination. For their software, the two school districts selected a computer-based learning system marketed by Jostens Learning Corporation.

Evaluation Questions

The purpose of the CAI/Cooperative Learning Project is to develop a replicable, independently validated, national model for integrating computer-assisted instruction through an integrated learning system that includes inquiry-based, hyper-media learning and cooperative learning techniques. An original feature of the project is the inclusion of cooperative education, creating a collaborative learning environment both within the classroom and at home. Based on the project goals, as specified in the project proposal, four outcome evaluation questions were formed to focus the evaluation study. They were:

1. To what extent does the program enhance mathematics and language arts achievement for the participating students?

   - To what extent is there an increase in the number of students in each school meeting and/or exceeding state standards on the TELLS test?

   - To what extent is there an increase in scores on the Stanford Achievement Test (SAT) for participating Pittston students and on the Iowa Test of Basic Skills (ITBS) for participating Hatboro-Horsham students?

2. To what extent does the program produce an increase in time-on-task behavior for participating students?

3. To what extent does the program enhance student and parent attitudes toward learning, the school, and education in general?

4. To what extent does the program enhance positive teacher and administrator attitudes toward the integrated learning system and cooperative learning?

In early discussions with the two project directors, it was decided that the evaluation for the project's first year should be primarily descriptive and focus on process and outcome concerns. An implementation focus for the first year study would help to insure that prerequisite conditions for proper program implementation were met. This is particularly important because, due to delayed funding and difficulties in ordering and receiving the necessary hardware and software, the project was not initiated until the second half of the school year. In addition, complex programs such as these, which require considerable equipment, training, and effort are frequently not fully operational in their first year. And even among programs which are operational, it is unrealistic to expect significant impact after only one year of implementation. However, it should be noted that a limitation of this first year study was having to rely primarily on surveys as implementation indicators. Also, cooperative learning was not included as part of the process evaluation as the project directors decided that it was not feasible to implement this component during year one.

The outcome component of the evaluation was designed to insure that the program and control groups at each site were comparable. This would help to rule out some plausible rival hypotheses for pretest-posttest differences when additional outcome data are collected in years two and three. Thus, the process and outcome evaluation questions which formed the focus of this first year study were as follows:

- To what extent was the project implemented as planned?
- To what extent were comparable control and experimental groups established within each of the districts and baseline data collected?

Evaluation Design and Procedures

This section describes the evaluation design, student sample, instrumentation, and data collection and analysis undertaken by RBS in connection with its first year evaluation of the CAI/Cooperative Learning Project implemented in two middle schools, one in the Pittston Area School District and one in the Hatboro-Horsham School District.

Design

The approach used to address the evaluation questions was to include quantitative data collection of curriculum-embedded tests, standardized achievement tests, and the TELLS. In addition, implementation and attitude measures were to be obtained through survey data collected at the beginning and end of the school year and through observations and informal interviews made during periodic visits to each of the sites. A pretest-posttest control group design was to be used (in years two and three) to enhance the validity of the findings, although there were differences in the nature of the control or comparison group at each school. For the Hatboro-Horsham School District, a control group was to be constituted from students within the same school who had no contact with computer-assisted instruction. For the Pittston Area School District, a control group was to consist of students within the school who had minimal contact with computer-assisted instruction.

Student Sample

The selection of the program and control group differed at each site. In the Hatboro-Horsham middle school each grade is divided into two heterogeneous teams, a red team and a black team. The program group was selected from only the red team and consisted of the 25 lowest-achieving students from each of the sixth, seventh, and eighth grades. All of these students had standardized achievement scores below grade level in

mathematics. The control group consisted of 25 comparable students from each of the black team's three grades (these students did not have computers in their classes).

The Pittston middle school was divided into two groups based on standardized achievement test scores, an at-risk or program group (i.e., scoring below the grade level median) and a not at-risk group. All students in the at-risk group were then randomly assigned to one of two groups, a "low use" group which received 15 minutes of computer time per week, or a "high use" group which received 60 minutes of computer time per week (in 15 minute segments). There were approximately 50 students in each group at each grade level. To balance the low and high use groups, students assigned to one group for mathematics will be assigned to the other group for reading. It should be noted that although the not at-risk group was also divided into low and high use groups, their data are not included in this report as the initial focus of the project was to be on low-achieving students. In both sites, this first year implementation was only for mathematics. Also, in each school program students (five at a time) were on a rotating schedule to bring a computer home for a six week period.

Instrumentation

A number of evaluation instruments were developed by RBS, and approved by the districts, for use in the three-year study. They included the following:

- Administrator Attitude Survey (pre and post)
- Teacher Attitude Survey (pre and post)
- Student Attitude Survey (pre and post)
- Parent Attitude Survey (pre and post)
- Computer Home Use Survey (pre and post)
- RBS Time-on-Task Measure.

The administrator and teacher attitude forms contain questions which address concerns regarding the new computer learning system, the advantages

and disadvantages of the system, the adequacy of training and follow-up technical assistance, the implementation of the system, the adequacy of the computer curriculum, and the effectiveness of the computer learning system. The student attitude form addresses attitude toward using the computer in school, and the advantages and disadvantages of the computer learning system; and the parent attitude form and the home use form ask about parent involvement in the program, their child's attitude toward participation, and the advantages and disadvantages of the computer learning system. The home use survey is developed for parents of those students, who on a rotating basis take a computer home to increase their time on the system and their parents' involvement in collaborative learning. The time-on-task measure was developed and validated by RBS to structure observations for collecting data on student engaged time.

Data Collection and Analysis

Both process and outcome (i.e., baseline) data were collected from the two sites. Process data were collected through attitude surveys, and informal interviews and observations. Because of the delays in start-up previously mentioned, most surveys were administered only once during the school year (pre-post data collection is planned for years two and three) and time-on-task measures were not obtained. Twice after the program was initiated, RBS met with the project director and computer coordinator from each district. On the second occasion, visits were made to a number of classrooms in each school to observe students working on the computer and interviews were conducted with the computer coordinator and teachers.

The baseline data submitted by the two districts consisted of standardized achievement test scores (the Stanford Achievement Test (SAT), for Pittston, and the Iowa Test of Basic Skills (ITBS), for

Hatboro-Horsham), and Basic Skills Inventory (BSI) data which reflected students' initial placement in the computer learning system's curriculum. As noted earlier, this data will be submitted at the beginning and end of years two and three to analyze achievement gains. The TELLS data were not submitted to RBS, as originally proposed, as the districts were waiting for the state's decision as to whether or not this testing program would continue. In the proposal, separate analyses were planned for process and outcome data from each district. However, since each site was only in partial operation for part of the 1990-91 school year, this report includes process and baseline data; posttest data were not collected and analyzed. As previously indicated, it was agreed to be premature to look at student achievement growth. The revised analysis plan for this first year was to analyze survey and interview data related to program implementation to provide information for program improvement planning for years two and three, and second, to examine baseline data to see the extent to which control and program groups were comparable.

Findings

The findings presented in this section of the report relate to the revised evaluation questions for year one. They are discussed in two separate sections, one for each evaluation question.

To What Extent was the Project Implemented as Planned?

In the fall of the 1990-91 school year, after some delay, each of the two sites ordered and received the computer hardware and software necessary for implementing the project; teachers were then provided with training and technical assistance for implementing the Jostens mathematics curriculum; program and control groups were identified; and schedules were developed for data collection and student computer use. During the second half of the

school year, baseline achievement and attitudinal data were collected and analyzed and identified students began to implement the mathematics portion of the Jostens curriculum. In addition, parental involvement was initiated at the two middle schools through providing information on the innovative program, requesting permission for their childs' participation, and through the initiation of the home computer use component.

Comprehensive planning was also underway for year two of the project, the 1991-92 school year. This included developing schedules for training teachers on the Jostens reading curriculum, developing and revising schedules for student computer use, and selecting program and control students for the new sixth grade students entering the program. Also, in discussions with RBS, plans were developed for periodic site visits and for collecting the data necessary to address the study's evaluation questions. Although the project's cooperative learning component had not been implemented, each site began exploring ways to phase in this component in coordination with a larger district effort.

Attitude Data. Attitude surveys were administered to administrators, teachers, students, and parents during the second half of the school year. These data are briefly described below, and presented separately for each district. A summary of all quantifiable survey data (i.e., mean ratings) is presented in Appendix A. Although some surveys were administered on more than one occasion, change data are not discussed here, as the average time span between these measures was only about three months.

Two administrators in the Hatboro-Horsham district completed the survey. Both agreed to having some experience in using computers and felt adequately trained for their role in the use of the computer system. They also agreed that the training adequately prepared their staff for use of the

computer system and that the follow-up technical assistance provided after training met staff needs. Of the 20 potential concerns about the new computer learning system listed on the survey form, one administrator did not agree with any and the other administrator indicated concern with only four of the items listed (i.e., a rating of 4 or 5 on the 5-point scale): the changes this system will cause teachers to make in their classrooms, the scheduling of students on the system, the follow-up technical assistance on the computer learning system, and the alignment of the system's curriculum and the district's curriculum and testing. In their comments, the administrators indicated major advantages of the computer learning system to be: provides individualized instruction, enables teachers to be more effective, and provides data for instructional decisions. Major problems listed were: limited hardware and need for additional teacher training.

The two Pittston administrators who completed the survey reported having no experience in using computers and did not participate in any training on using the new computer system. One administrator felt that the staff training adequately prepared them for using the computer system and the other administrator reported that the training adequately covered mathematics, but not reading. In contrast to the Hatboro-Horsham administrators, these respondents agreed with the majority of the 20 potential concerns listed on the survey (i.e., a rating of 4 or 5 on the 5-point scale). The items <u>not</u> of concern were: student attitude toward the system, knowledge that other approaches work better, their personal limited knowledge of computers, the effects of the system on students, and the value of instruction students receive on the system. Based on their understanding of the computer learning system, the administrators listed its major advantages to be the opportunity to help slow learners, the positive impact

on student motivation and interest in school work, and students' increased access to materials. They reported no major disadvantages to the system and the only recommendation was to "speed up the timetable."

Of the nine teachers in the Hatboro-Horsham middle school who were administered the survey, six had some prior computer experience, one had very little experience, and two reported having more extensive computer experience (mean rating of 3.1 on a 5-point scale). In terms of their preparation for using the new computer system and for covering the curriculum implemented (i.e., mathematics), six teachers felt somewhat prepared, one teacher felt well prepared, and two teachers indicated that they were not adequately trained. Three of the 20 concerns about the new computer learning system listed on the survey were felt by the majority of respondents to be strong concerns (i.e., a rating of 4 or 5 on the 5-point scale). They were: a concern about how much time and paperwork the computer system takes, a concern about the scheduling of students, and a concern about how well the computer system's curriculum aligns with the district curriculum and testing. The teachers listed the major advantages of the computer learning system to be: individualization, reinforcement, motivation, and the fact that it's a new approach. In their comments, they listed the major disadvantages of the system to be: scheduling, the loss of class time for students working on computers, and the limited number of computers.

Six teachers in the Pittston middle school completed the survey; five reported having some computer experience and one teacher reported having little computer experience (mean rating of 2.8 on a 5-point scale). These teachers did not respond to survey items concerning the training and technical assistance received in preparation for using the system (perhaps

the staff training was still being conducted at the time of the survey). In terms of the 20 concerns listed on the survey, no concern received strong agreement from more than one or two teachers (i.e., a rating of 4 or 5 on the 5-point scale or a mean of 3.0 or higher). Interestingly, the Pittston teachers listed major advantages (individualization, alternative approach) and disadvantages (scheduling, loss of class time) of the new computer learning system similar to those listed by the Hatboro-Horsham teachers.

The student survey was completed by 68 students in the Hatboro-Horsham middle school and 150 students (66 from the Low Use group and 84 from the High Use group) in the Pittston middle school. Overall, students in both districts gave very positive responses to the survey's 30 "yes-no" items. They indicated that they liked using the computer at school, that the computer was easy to use, that computers make it fun to learn, and that they can do most of the computer lessons without help from anyone else (85 percent or more of the students in each district responded positively to these items). Seventy-five percent of the Hatboro-Horsham students and sixty-five percent of the Pittston students indicated that the computer helped them to learn math better, and over ninety percent of the students in each district indicated that they liked computer work better than written assignments. More than half of the students in each group reported that the computer lessons help them to do work in the classroom better. When asked if their parents think they are learning from the computer, 53 percent of the Hatboro-Horsham students and 63 percent of the Pittston students responded positively.

The involvement of parents was felt to be an important component of the project. Parents learned about the project through an initial letter describing the project and requesting permission for their child's

participation and through progress reports included in parent conferences and, in the Pittston district, attached to student report cards. In addition, parents were to receive a general survey and a home use survey. However, the results for the parent survey are not included in this report as both districts felt it was premature to look at parent responses; the Pittston district did not administer the survey and, although it was administered in the Hatboro-Horsham district, many parents commented that they were uncomfortable responding at this time. Nine parents of children who took computers home to use as part of the project (five in Hatboro-Horsham and four in Pittston) completed and returned the home use survey. Overall, these parents' indic ted that their children frequently worked on the computer and seemed to enjoy and benefit from their computer work. Most parents reported that they did not work with their child on the computer system.

To What Extent Were Comparable Control and Experimental Groups Established Within Each of the Districts and Baseline Data Collected?

In interviews with the computer coordinator and project director in each district, they indicated that the control groups were formed by a combination of matching and randomization. Pretest or baseline data for the program and control students were submitted to RBS and summarized. These data are summarized in the following paragraphs.

Achievement data. The first type of achievement data, presented in Table 1, is embedded testing data from the computer system curriculum. It should be noted that only the mathematics curriculum was implemented, thus reading placement data are not included. The rationale for looking at this data is that, if the computer learning system is to have an impact on student achievement in general, it must first be able to demonstrate a more

Table 1

Student Basic Skills Inventory (BSI) Scores by Grade

School/Grade	N	Group	Mean Placement (Grade Level)
HATBORO-HORSHAM MS			
6	25	Program	4.0
7	16	Program	3.8
8	18	Program	4.5
PITTSTON MS			
6	49	Low Use	4.1
	45	High Use	3.9
7	47	Low Use	4.5
	51	High Use	4.2
8	34	Low Use	4.9
	54	High Use	4.9

Note: BSI scores are for mathematics only; implementation of the reading curriculum is planned for year two. The two Pittston Groups (Low Use and High Use) represent two levels of program participation (i.e., 15 minutes/week of computer time or 60 minutes/week computer time).

immediate impact on the embedded testing in the curriculum. As the table indicates, the mean placement level on the Basic Skills Inventory (the CAI embedded test) for each grade was at a level below students' actual grade level. In addition, both computer coordinators commented that some initial placements had to be upwardly adjusted in order to ensure that students were being challenged at appropriate levels.

Standardized achievement test scores will be collected, on a pre-post basis, in order to see if progress on the computer system curriculum is transferable to standardized achievement tests. Table 2 presents this baseline data (SAT and IOWA) for program and control groups in the two districts. Listed in the table are mean NCE scores, standard deviations (SD), and a t test for independent sample for mathematics and reading at each grade level. NCE comparisons indicate how well children in these two schools fare achievement-wise in comparison to the rest of the country. As the table indicates, prior to implementation of the program most students (program and control) were performing at below grade level or below average (an NCE of 50 is at grade level). The results of the t tests indicate that the program and control groups were similar with respect to achievement scores. And, in the 2 cases where there were pretest differences (reading scores for Hatboro-Horsham grade 8 and Pittston grade 6), analysis of covariance can be used to make adjustments in analyzing achievement gains.

Conclusions and Implications

Although delays in the acquisition of hardware and software for the computer learning system prevented the two schools from starting to implement the program on schedule, by the end of the school year the mathematics portion of the program was implemented, as planned. Baseline data was collected and indicated program and control groups were properly

Table 2

Student Achievement Scores for Program and Control Groups
(NCE Scores)

School/Grade	N	Group	Mathematics Mean	SD	t	Reading Mean	SD	t
HATBORO-HORSHAM MS								
6	23	Program	44	12	ns	46	11	ns
	22	Control	46	11		42	14	
7	20	Program	38	8	ns	39	12	ns
	25	Control	38	8		44	9	
8	17	Program	37	14	ns	40	10	-2.12*
	20	Control	40	13		47	12	
PITTSTON MS								
6	49	Low Use	50	14	ns	41	10	-2.05*
	45	High Use	51	14		46	13	
7	45	Low Use	46	9	ns	43	11	ns
	51	High Use	46	10		46	10	
8	33	Low Use	49	12	ns	48	14	ns
	56	High Use	45	15		46	15	

* $p < .05$

Note: Hatboro-Horsham scores are for the Iowa Test of Basic Skills (ITBS); Pittston scores are for the Stanford Achievement Test (SAT). The two Pittston groups (Low Use and High Use) represent two levels of program participation (i.e., 15 minutes/week of computer time or 60 minutes/week computer time).

selected and comparable. For years two and three, additional adjustment for pretest differences which might confound differences between the program and control groups will be made statistically (e.g., using analysis of covariance). However, for this first year of the project, the shortened implementation made difficult the analysis of any impact; that is, to expect evidence of meaningful student achievement gains in less than a year (and some say, not until a program has stabilized).

This first evaluation has several implications for the project in years two and three.

- Implementation of computer-assisted instructional programs commonly experience delays in the acquisition of resources which are beyond the control of local districts. To the extent possible, these delays should be anticipated, particularly in planning with vendors.

- A program of this complexity should not expect all components to be implemented concurrently (e.g., different curriculum, home component, cooperative learning). Perhaps planning for a number of implementation phases or steps would be more realistic and would result in fewer concerns about change for those involved.

- Program staff must continue to assess and be responsive to teacher (administrator, and parent) concerns, particularly with regard to training and scheduling. However, RBS has found in evaluating similar computer-assisted instructional programs, that teachers' initial concerns tend to result in much more positive attitudes over time.

- Student placement in the computer learning system should be closely monitored as it was reported by the districts that some students were placed far below grade level. This below grade level placement also has implications for any expected impact on standardized test scores, i.e., to expect an impact, the subject matter for the curriculum and test must be related.

- The number of students in the comparable program and control groups at each school should be the same, or as close as possible, and efforts should be made to obtain data from all identified students. Although statistical procedures can control for small group differences, the eighth grade at the Pittston middle school had almost twice as many students in the High Use group (56) as in the Low Use group (34).

- Use of the pretest-posttest control group design in years two and three controls for most threats to internal validity and thus

eliminates alternative hypotheses for changes in student achievement. However, the one threat not controlled for, and which should be closely monitored by the two sites, is whether there is any change in program and control group composition in the two middle schools.

- The cooperative learning component of the program needs to be adequately addressed. That is, either plans must be developed for its implementation and evaluation or the project (e.g., goals, title) should be revised to reflect the elimination of this major component from the design.

- The parent involvement component of the program needs to be informed and guided by each child's teacher in order to optimize student impact. In addition to general information on the project, parents need information on how to interpret the computer learning system reports and the project's expectations for parental participation and support. This is particularly critical if a home application component is to be introduced and evaluated.

APPENDIX

Mean Survey Responses for Rated Items

Administrator Survey
Hatboro-Horsham School District (N=2)

	Item	Mean	NR
A.4.	To what extent are you experienced in using computers?	2.5	
B.1.	I don't know enough about the computer learning system.	2.0	
B.2.	I am concerned about the attitude of students toward the computer system	1.5	
B.3.	I know of other approaches that might work better.	2.0	
B.4.	I have very limited knowledge about computers.	2.5	
B.5.	I am concerned about the effects of the system on students.	1.0	
B.6.	I am concerned about the changes this system will cause teachers to make in their classrooms.	3.0	
B.7.	I am concerned about how much time and paperwork the computer system takes.	2.5	
B.8.	I am concerned about how the scheduling of students on the system works out.	3.0	
B.9.	I am concerned about the time and energy commitments the computer system requires.	2.5	
B.10.	I am concerned about the knowing how to use the hardware.	2.0	
B.11.	I am concerned about knowing how to use the software.	1.5	
B.12.	I am concerned about the curriculum content of the computer learning system.	1.5	
B.13.	I am concerned about the instructional approach used by the computer learning system.	1.5	
B.14.	I am concerned about the training I receive on the computer learning system.	1.0	
B.15.	I am concerned about the follow-up technical assistance I receive on the computer learning system.	2.5	
B.16.	I am concerned about how well the computer system's curriculum aligns with our district curriculum and testing.	3.0	

B.17.	I am concerned about the use of computer printouts from the system.	2.5	
B.18.	I would like to know how this system is better than what we had before.	2.0	
B.19.	I am not interested in learning more about the system.	2.0	
B.20.	I am concerned about the value of instruction students receive on the system.	2.0	
D.2.	To what extent do you feel the training adequately prepared you personally, for your role in use of the computer system?	3.5	
D.4.	To what extent do you feel the training adequately prepared your staff for use of the computer system?	4.0	
D.5.	To what extent has the inservice training your staff received adequately covered the following areas?		
	Reading	3.5	
	Math	4.5	
	Writing	3.0	
	Science	3.0	
	Higher Order Thinking Skills	2.5	
	Use of Student results reports	3.0	
	Integration of computer curriculum with classroom program	2.5	
	Hands-on experience with the computer system	4.0	
	Scheduling of students	3.5	
D.7.	To what extent do you feel the follow-up technical assistance provided after training was adequate to meet the needs of you and your staff?	4.0	
D.8.	To what extent has there been a need for follow-up technical assistance in the following areas?		
	Reading	3.5	
	Math	4.0	1
	Writing	5.0	1
	Science	4.0	
	Higher Order Thinking Skills	2.5	
	Use of Student results reports	3.0	
	Integration of computer curriculum with classroom program	2.5	
	Hands-on experience with the computer system	3.0	
	Scheduling of students	3.0	

D.9.	To what extent have the following documents met your staff needs?		
	Curriculum Guides	4.0	
	Teacher Guides	4.5	
	Teacher Handbooks	4.5	
E.2.	To what extent are the reports clearly organized and easy to use?	4.0	
E.3.	To what extent have the reports enabled your staff to:		
	Diagnose student needs	4.0	
	Individualize instruction	4.0	
	Group students by ability	3.0	
	Inform parents of student progress	3.0	
E.4.	To what extent have the reports been useful to you as an administrator?	3.0	
E.5.	To what extent has the computer system resulted in reallocation of time in the following areas?		
	Reading	3.0	
	Math	3.0	
	Writing	2.0	1
	Science	--	2
E.6.	To what extent has the computer system resulted in increased time-on-task for all students in the following subject areas?		
	Reading	4.5	
	Math	4.5	
	Writing	4.0	1
	Science	--	2
E.7.	To what extent do students enjoy working on their computer lessons?	4.5	
E.8.	To what extent do you observe students working on lessons at the computer?	4.5	
E.9.	To what extent has the computer system hardware been reliable and dependable?	4.0	
E.10.	To what extent has implementation and operation of the computer system created administrative problems for you?	1.5	

F.1	To what extent is the computer curriculum sufficiently comprehensive to provide adequately for the learning needs of students in each of the following subjects?		
	Reading	4.0	1
	Math	4.0	1
	Writing	4.0	1
	Science	--	2
F.2.	To what extent are the learning strategies and models presented in the computer lessons supportive of the instructional methods used in the school in each of the following subjects?		
	Reading	4.0	1
	Math	4.0	1
	Writing	4.0	1
	Science	--	2
F.3.	To what extent is there sufficient flexibility in the sequencing of the units that the computer program can be aligned with the school's classroom programs in each of the following subjects?		
	Reading	3.0	1
	Math	3.0	1
	Writing	5.0	1
	Science	--	2
F.4.	To what extent do computer system lessons adequately prepare students for standardized achievement tests?		
	Reading	4.0	1
	Math	4.0	1
	Writing	--	2
	Science	--	2
F.5.	To what extent does the computer system curriculum meet your expectations?		
	Reading	4.0	1
	Math	4.0	1
	Writing	4.0	1
	Science	--	2
G.1.	To what extent is there increased student motivation and interest in your school as a result of students participating in the computer learning system?	4.0	1

G.2.	To what extent has the computer program led to higher student achievement?		
	Reading	--	2
	Math	--	2
	Writing	--	2
	Science	--	2
G.3.	To what extent has the computer system promoted student class participation?	4.0	1
G.4.	To what extent has the computer system promoted greated parent interest and involvement in the school?	3.0	1
G.5.	To what extent has the computer system enhanced teacher effectiveness?	3.0	1
G.6.	To what extent has the computer system enhanced teacher communication and cooperation?	4.0	1

Administrator Survey
Pittston School District (N=2)

	Item	Mean	NR
A.4.	To what extent are you experienced in using computers?	4.0	
B.1.	I don't know enough about the computer learning system.	4.0	
B.2.	I am concerned about the attitude of students toward the computer system.	2.5	
B.3.	I know of other approaches that might work better.	1.5	
B.4.	I have very limited knowledge about computers.	3.0	
B.5.	I am concerned about the effects of the system on students.	3.5	
B.6.	I am concerned about the changes this system will cause teachers to make in their classrooms.	4.0	
B.7.	I am concerned about how much time and paperwork the computer system takes.	4.0	
B.8.	I am concerned about how the scheduling of students on the system works out.	4.0	
B.9.	I am concerned about the time and energy commitments the computer system requires.	4.0	
B.10.	I am concerned about the knowing how to use the hardware.	4.5	
B.11.	I am concerned about knowing how to use the software.	5.0	
B.12.	I am concerned about the curriculum content of the computer learning system.	4.5	
B.13.	I am concerned about the instructional approach used by the computer learning system.	4.5	
B.14.	I am concerned about the training I receive on the computer learning system.	5.0	
B.15.	I am concerned about the follow-up technical assistance I receive on the computer learning system.	4.5	
B.16.	I am concerned about how well the computer system's curriculum aligns with our district curriculum and testing.	4.5	

B.17.	I am concerned about the use of computer printouts from the system.	4.5	
B.18.	I would like to know how this system is better than what we had before.	4.5	
B.19.	I am not interested in learning more about the system.	3.0	
B.20.	I am concerned about the value of instruction students receive on the system.	3.5	
D.1.	How many hours of training did you receive to prepare you, personally, for your role in use of the computer system?		2
D.2.	To what extent do you feel the training adequately prepared you personally, for your role in use of the computer system?	1.0	1
D.4.	To what extent do you feel the training adequately prepared your staff for use of the computer system?	4.0	
D.5.	To what extent has the inservice training your staff received adequately covered the following areas?		
	Reading	4.0	
	Math	5.0	
	Writing	1.0	
	Science	1.0	
	Higher Order Thinking Skills	1.0	
	Use of Student results reports	1.0	
	Integration of computer curriculum with classroom program	2.0	
	Hands-on experience with the computer system	3.5	
	Scheduling of students	3.5	
D.7.	To what extent do you feel the follow-up technical assistance provided after training was adequate to meet the needs of you and your staff?	2.0	
D.8.	To what extent has there been a need for follow-up technical assistance in the following areas?		
	Reading	4.0	
	Math	1.0	1
	Writing	1.0	1
	Science	1.0	1
	Higher Order Thinking Skills	1.0	1
	Use of Student results reports	1.0	1
	Integration of computer curriculum with classroom program	1.0	1
	Hands-on experience with the computer system	1.0	1
	Scheduling of students	1.0	

D.9.	To what extent have the rollowing documents met your staff's needs?		
	Curriculum Guides	4.0	
	Teacher Guides	4.0	
	Teacher Handbooks	4.0	
E.2.	To what extent are the reports clearly organized and easy to use?	3.5	
E.3.	To what extent have the reports enabled your staff to:		
	Diagnose student needs	3.5	
	Individualize instruction	4.0	
	Group students by ability	4.0	
	Inform parents of student progress	4.0	
E.4.	To what extent have the reports been useful to you as an administrator?	3.5	
E.5.	To what extent has the computer system resulted in reallocation of time in the following areas?		
	Reading	4.5	
	Math	4.5	
	Writing	1.0	1
	Science	1.0	1
E.6.	To what extent has the computer system resulted in increased time-on-task for all students in the following subject areas?		
	Reading	4.5	
	Math	4.5	
	Writing	1.0	1
	Science	1.0	1
E.7.	To what extent do students enjoy working on their computer lessons?	5.0	
E.8.	To what extent do you observe students working on lessons at the computer?	4.5	
E.9.	To what extent has the computer system hardware been reliable and dependable?	4.5	
E.10.	To what extent has implementation and operation of the computer system created administrative problems for you?	1.5	

F.1	To what extent is the computer curriculum sufficiently comprehensive to provide adequately for the learning needs of students in each of the following subjects?		
	Reading	2.5	
	Math	4.5	
	Writing	1.0	1
	Science	1.0	1
F.2.	To what extent are the learning strategies and models presented in the computer lessons supportive of the instructional methods used in the school in each of the following subjects?		
	Reading	2.5	
	Math	4.5	
	Writing	1.0	1
	Science	1.0	1
F.3.	To what extent is there sufficient flexibility in the sequencing of the units that the computer program can be aligned with the school's classroom programs in each of the following subjects?		
	Reading	2.5	
	Math	4.5	
	Writing	1.0	1
	Science	1.0	1
F.4.	To what extent do computer system lessons adequately prepare students for standardized achievement tests?		
	Reading	2.5	
	Math	4.5	
	Writing	1.0	1
	Science	1.0	1
F.5.	To what extent does the computer system curriculum meet your expectations?		
	Reading	2.5	
	Math	4.5	
	Writing	1.0	1
	Science	1.0	1
G.1.	To what extent is there increased student motivation and interest in your school as a result of students participating in the computer learning system?	4.5	

G.2.	To what extent has the computer program led to higher student achievement?		
	Reading	2.5	
	Math	4.5	
	Writing	1.0	1
	Science	1.0	1
G.3.	To what extent has the computer system promoted student class participation?	4.0	
G.4.	To what extent has the computer system promoted greated parent interest and involvement in the school?	4.0	
G.5.	To what extent has the computer system enhanced teacher effectiveness?	4.0	
G.6.	To what extent has the computer system enhanced teacher communication and cooperation?	4.0	

Teacher Survey
Hatboro-Horsham Middle School (N=9)

	Item	Mean	NR
A.4.	To what extent are you experienced in using computers?	3.1	
B.1.	I don't know enough about the computer learning system.	2.9	
B.2.	I am concerned about the attitude of students toward the computer system.	2.8	
B.3.	I know of other approaches that might work better.	2.3	1
B.4.	I have very limited knowledge about computers.	2.1	
B.5.	I am concerned about the effects of the system on students.	2.0	
B.6.	I am concerned about the changes this system will cause teachers to make in their classrooms.	3.0	
B.7.	I am concerned about how much time and paperwork the computer system takes.	3.2	
B.8.	I am concerned about how the scheduling of students on the system works out.	3.7	
B.9.	I am concerned about the time and energy commitments the computer system requires.	3.3	
B.10.	I am concerned about the knowing how to use the hardware.	2.6	
B.11.	I am concerned about knowing how to use the software.	3.0	
B.12.	I am concerned about the curriculum content of the computer learning system.	3.0	
B.13.	I am concerned about the instructional approach used by the computer learning system.	2.8	
B.14.	I am concerned about the training I receive on the computer learning system.	2.6	
B.15.	I am concerned about the follow-up technical assistance I receive on the computer learning system.	2.8	
B.16.	I am concerned about how well the computer system's curriculum aligns with our district curriculum and testing.	3.3	

B.17.	I am concerned about the use of computer printouts from the system.	2.7	
B.18.	I would like to know how this system is better than what we had before.	2.3	1
B.19.	I am not interested in learning more about the system.	2.3	1
B.20.	I am concerned about the value of instruction students receive on the system.	2.9	
D.2.	To what extent do you feel the training adequately prepared you personally, for your role in use of the computer system?	2.8	
D.3.	To what extent has the inservice training you received adequately covered the following areas?		
	Reading	2.6	4
	Math	3.8	2
	Writing	2.2	4
	Science	1.7	6
	Higher Order Thinking Skills	2.7	3
	Use of Student results reports	2.5	1
	Integration of computer curriculum with classroom program	2.0	2
	Hands-on experience with the computer system	3.4	1
	Scheduling of students	1.7	2
D.4.	To what extent have the following documents met your needs?		
	Curriculum Guides	3.3	1
	Teacher Guides	3.3	1
	Teacher Handbooks	3.0	2
E.2.	To what extent are the reports clearly organized and easy to use?	1.8	1
E.3.	To what extent have the reports enabled you to:		
	Diagnose student needs	3.4	1
	Individualize instruction	3.1	2
	Group students by ability	2.9	2
	Inform parents of student progress	3.0	2
E.4.	To what extent do computer system student reports agree with your own evaluations of student classwork?		
	Reading		6
	Math		3
	Writing		8
	Science		9

E.5.	To what extent has the computer system resulted in reallocation of time in the following areas?		
	Reading		8
	Math		3
	Writing		8
	Science		9
E.6.	To what extent has the computer system resulted in increased time-on-task for all students in the following subject areas?		
	Reading	4.0	7
	Math	3.4	2
	Writing	4.0	8
	Science	--	9
E.7.	To what extent do students enjoy working on their computer lessons?	2.0	
E.8.	To what extent do you observe students working on lessons at the computer?	3.3	1
E.9.	To what extent are you comfortable with the use of the computer system?	2.6	
F.1	To what extent is the computer curriculum sufficiently comprehensive to provide adequately for the learning needs of students in each of the following subjects?		
	Reading	3.7	6
	Math	3.7	2
	Writing	4.0	8
	Science	--	9
F.2.	To what extent are the learning strategies and models presented in the computer lessons supportive of the instructional methods used in the school in each of the following subjects?		
	Reading	3.3	6
	Math	3.3	2
	Writing	4.0	8
	Science	--	9
F.3.	To what extent is there sufficient flexibility in the sequencing of the units that the computer program can be aligned with the school's classroom programs in each of the following subjects?		
	Reading	2.5	7
	Math	3.0	5
	Writing	4.0	8
	Science	--	9

F.4.	To what extent do computer system lessons adequately prepare students for standardized achievement tests?		
	Reading	3.0	8
	Math	3.3	3
	Writing	--	9
	Science	--	9
F.5.	To what extent does the computer system curriculum meet your expectations?		
	Reading	4.5	7
	Math	4.2	4
	Writing	5.0	8
	Science	--	9
G.1.	To what extent is there increased student motivation and interest in your school as a result of students participating in the computer learning system?	4.0	1
	Reading	3.5	7
	Math	3.3	2
	Writing	4.0	8
	Science	--	9
G.2.	To what extent has the computer program led to higher student achievement?		
	Reading	3.0	8
	Math	2.7	2
	Writing	4.0	8
	Science	--	9
G.3.	To what extent has the computer system served to enhance your own classroom teaching?		
	Reading	3.5	7
	Math	3.0	3
	Writing	4.0	8
	Science	--	9

Teacher Survey
Pittston Area Middle School (N=6)

	Item	Mean	NR
A.4.	To what extent are you experienced in using computers?	2.8	
B.1.	I don't know enough about the computer learning system.	2.2	
B.2.	I am concerned about the attitude of students toward the computer system.	1.7	
B.3.	I know of other approaches that might work better.	1.5	
B.4.	I have very limited knowledge about computers.	2.8	
B.5.	I am concerned about the effects of the system on students.	2.3	
B.6.	I am concerned about the changes this system will cause teachers to make in their classrooms.	2.3	
B.7.	I am concerned about how much time and paperwork the computer system takes.	2.2	
B.8.	I am concerned about how the scheduling of students on the system works out.	2.8	
B.9.	I am concerned about the time and energy commitments the computer system requires.	2.3	
B.10.	I am concerned about the knowing how to use the hardware.	2.3	
B.11.	I am concerned about knowing how to use the software.	2.2	
B.12.	I am concerned about the curriculum content of the computer learning system.	2.7	
B.13.	I am concerned about the instructional approach used by the computer learning system.	2.5	
B.14.	I am concerned about the training I receive on the computer learning system.	2.3	
B.15.	I am concerned about the follow-up technical assistance I receive on the computer learning system.	2.7	
B.16.	I am concerned about how well the computer system's curriculum aligns with our district curriculum and testing.	2.3	

B.17.	I am concerned about the use of computer printouts from the system.	2.3
B.18.	I would like to know how this system is better than what we had before.	1.3
B.19.	I am not interested in learning more about the system.	1.7
B.20.	I am concerned about the value of instruction students receive on the system.	2.5

(Teachers did not respond to the remaining sections of the survey.)

Parent Survey
Hatboro-Horsham Middle School (N=46)

	Item	Mean	NR
A.5.	How well informed are you about the new computer learning system at your child's school?	2.3	
A.6.	Have you been invited by the school to visit your child's classroom?	1.6	
A.7.	Did you visit your child's classroom?	1.7	
A.8.	Have you observed your child working at the computer in school?	2.0	
A.9.	Have you attended a parent conference at school?	1.3	
A.10.	Did the teacher ever discuss your child's progress on the computer program?	1.9	
A.11.	Does your child talk about work on the computer after coming home from school?	1.3	
A.12.	Has work on the computer made your child more enthusiastic about school?	1.5	
A.13.	Does your child like school better this year because of work on the computer?	1.5	
A.14.	Is there a computer in your home?	1.6	
B.1.	My child feels good about the academic progress being made on the computer.	3.6	
B.2.	My child's teacher keeps me informed about my child's progress on the computer.	1.6	
B.3.	Parents are encouraged to visit the school.	2.8	
B.4.	My child frequently says positive things about the computer program.	3.3	
B.5.	My child looks forward to days that are scheduled for work on the computer.	3.6	
B.6.	My child's attitude toward school has improved because of the computer program.	2.9	
B.7.	My child's attitude toward learning has improved because of the computer program.	3.0	
B.8.	My child's reading skills have improve because of the computer program.	2.9	

B.9.	My child's math skills have improved because of the computer program.	3.4
B.10.	My child's writing skills have improved because of the computer program.	2.7

Computer Home Use Survey
Hatboro-Horsham Middle School (N=5)

	Item	Mean	NR
B.2.	How difficult was it for your child to learn how to use the computer system?	5.0	1
B.3.	How often did your child use the computer system at home?	3.5	
B.7.	How frequently did you work with your child during use of the computer system?	1.6	
B.8.	To what extent did your child enjoy working on the computer system?	4.0	
B.9.	To what extent did your child learn from using the computer system at home?	4.0	
B.10.	To what extent did your child's math skills improve from working on the computer system at home?	3.8	1
B.11.	To what extent did your child's reading skills improve from working on the computer system at home?	3.0	2
B.12.	To what extent did your child's writing skills improve from working on the computer system at home?	2.7	2
B.13.	To what extent did your child's understanding of science improve from working on the computer system at home?	1.0	1

Computer Home Use Survey
Pittston Area Middle School (N=4)

	Item	Mean	NR
B.2.	How difficult was it for your child to learn how to use the computer system?	5.0	
B.3.	How often did your child us the computer system at home?	4.8	
B.7.	How frequently did you work with your child during use of the computer system?	2.0	
B.8.	To what extent did your child enjoy working on the computer system?	4.8	
B.9.	To what extent did your child learn from using the computer system at home?	5.0	
B.10.	To what extent did your child's math skills improve from working on the computer system at home?	4.3	
B.11.	To what extent did your child's reading skills improve from working on the computer system at home?	4.3	
B.12.	To what extent did your child's writing skills improve from working on the computer system at home?	2.3	1
B.13.	To what extent did your child's understanding of science improve from working on the computer system at home?	3.0	1

Student Survey
Hatboro-Horsham Middle School (N=68)

	Item	Percent Responding Yes	No	NR
1.	Do you like school?	60	37	3
2.	Is the computer easy to use?	99	1	
3.	Is working on the computer fun?	84	13	3
4.	Do computers make it fun to learn?	85	13	2
5.	Do you learn a lot on the computer?	74	25	1
6.	Do computers make school subjects more interesting?	57	41	2
7.	Do you get bored working on the computer by yourself?	53	46	1
8.	Do you need much help when working on the computer?	4	96	
9.	Does your computer give you help when you need it?	81	18	1
10.	Does the computer help you correct your mistakes?	90	10	
11.	Do you have to hurry when you work on the computer?	12	88	
12.	Do you like computer work better than written assignments?	93	7	
13.	Is it important to do well on your computer assignments?	85	12	3
14.	Does working on the computer help you do better in school?	65	29	6
15.	Does your teacher know whether you make mistakes on your computer assignments?	54	40	6
16.	Do you get good grades when you work hard in school?	88	9	3
17.	Do you like going to the computer?	85	15	
18.	Would you like to go to the computer more often?	66	34	
19.	Have you worked on a computer in school before this year?	78	22	

620.	Do you have a computer at home?	47	53	
21.	Do you like using the computer at school?	87	13	
22.	Has the computer helped you to learn math better?	75	25	
23.	Has the puter helped you to read better?	32	56	12
24.	Has the computer helped you to write better?	13	72	15
25.	Has the computer helped you to understand science better?	3	71	26
26.	Can you do most of the computer lessons without help from anyone else?	93	7	
27.	Are the computer lessons interesting?	69	28	3
28.	Do your computer lessons help you do work in the classroom better?	57	43	
29.	Is your time with the computer the best part of your day?	29	69	2
30.	Do your parents think you are learning from the computer?	53	32	15

Student Survey
Pittston Area Middle School (N=150)

	Item	Percent Responding Yes	No	NR
1.	Do you like school?	51	45	4
2.	Is the computer easy to use?	95	5	
3.	Is working on the computer fun?	94	6	
4.	Do computers make it fun to learn?	91	9	
5.	Do you learn a lot on the computer?	77	22	1
6.	Do computers make school subjects more interesting?	80	19	1
7.	Do you get bored working on the computer by yourself?	26	73	1
8.	Do you need much help when working on the computer?	8	91	1
9.	Does your computer give you help when you need it?	83	16	1
10.	Does the computer help you correct your mistakes?	81	16	3
11.	Do you have to hurry when you work on the computer?	23	73	4
12.	Do you like computer work better than written assignments?	91	7	2
13.	Is it important to do well on your computer assignments?	75	19	6
14.	Does working on the computer help you do better in school?	61	34	5
15.	Does your teacher know whether you make mistakes on your computer assignments?	53	41	5
16.	Do you get good grades when you work hard in school?	81	15	4
17.	Do you like going to the computer?	89	7	4
18.	Would you like to go to the computer more often?	89	9	2
19.	Have you worked on a computer in school before this year?	93	5	2

20.	Do you have a computer at home?	33	64	3
21.	Do you like using the computer at school?	89	8	3
22.	Has the computer helped you to learn math better?	65	29	6
23.	Has the computer helped you to read better?	37	55	8
24.	Has the computer helped you to write better?	17	77	6
25.	Has the computer helped you to understand science better?	25	68	7
26.	Can you do most of the computer lessons without help from anyone else?	85	11	4
27.	Are the computer lessons interesting?	80	15	5
28.	Do your computer lessons help you do work in the classroom better?	61	35	4
29.	Is your time with the computer the best part of your day?	41	57	2
30.	Do your parents think you are learning from the computer?	63	27	10

END

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