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ABSTRACT

In order to evaluate the effectiveness of the elementary computer laboratories and the Educational Systems Corporation (ESC) software in the Fayette County (Kentucky) Public Schools, a Likert-type questionnaire on teacher attitudes and beliefs was designed, field-tested, revised, and distributed at the end of the 1988 spring semester. Analyses of the 173 responses received indicated that the teachers had very positive attitudes toward the computers, the labs, and the software. Teachers were extremely positive about the decision to set up computer labs with the ESC mathematics and reading software, and a large number felt that each of their students was "on task" throughout the lab period. Most considered the ESC software to be compatible with current mathematics and reading curriculum content and methods. In general, teachers wanted more laboratory time to use the software with their classes. Most teachers stated that they would be willing to work with other staff members and consultants to become more effective in using software for instruction. A copy of the questionnaire with a tally of the responses and comments offered by 53 of the respondents are appended. (6 references) (GL)

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TEACHER ASSESSMENT OF ELEMENTARY SCHOOLS' COMPUTER LABORATORIES

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September 8, 1988

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SCHOOLS' COMPUTER LABORATORIES

INTRODUCTION The installation of the computer laboratories in the elementary schools of Fayette County has the potential to change the method of education. However, for a successful and meaningful change to occur, positive teacher attitudes toward the change must exist. What appears to be a desirable goal in principle, must be viewed as desirable by the teachers involved before the goal can be implemented efficiently and effectively into the school (Woodrow, 1987). As Brovey and Chen (1982) point out, teacher attitudes and teaching behaviors are very resistant to change concerning the introduction of computers. The role of teacher attitudes toward computers is so important to the successful implementation of computers in education that the attitudes of the educators involved should be evaluated periodically during the early stages of computer introduction (Stevens, 1982). One widely used, valid way to evaluate teacher attitudes is the use of a Likert-type questionnaire (Cambre and Cook, 1985; Wedman and Heller, 1984; Cicchelli and Baecher, 1985).

SURVEY DESIGN AND METHODS To evaluate the effectiveness of the elementary computer laboratories and the Educational Systems Corporation (ESC) software in the Fayette County Public Schools, a Likert-type questionnaire on teacher attitudes and beliefs was designed, field-tested, revised, and distributed at the end of the 1988 spring semester.

The survey instrument was designed to assess teachers' attitudes and beliefs about:

1. utilizing computers in education;
2. utilizing computers in a laboratory setting;
3. the overall quality of the ESC software;
4. the quality of the ESC software in mathematics instruction;
5. the quality of the ESC software in reading instruction;
6. students interactions with the computers in the laboratories;
7. computer laboratory utilization.

Of the 178 teachers using the computer laboratories, 173 teachers responded to this survey. Therefore, it can be assumed that the following attitudes and beliefs accurately represent the teachers' feelings toward the utilization of computers with the ESC software in the laboratory setting in the Fayette County elementary schools.

The county's seven elementary schools that had computer labs with the ESC software in place for at least full one year were included in the survey. They were: Lansdowne, Cardinal Valley, Mary Todd, Harrison, Cassidy, Clays Mill, and Arlington. (Note: Garden Springs was to be included in this survey. Because of a fire during the school year the lab was destroyed.) In each of these seven elementary schools the lab set up was identical. Each had 29 computer stations, one master station, one lab system attendant, and the identical ESC software used at the same rate and level per grade level. Each class at the schools went into the computer lab twice per week, averaging two completed mathematics and two reading lessons each week. All

teachers were required to accompany and assist their students while in the labs. Overall, 10 kindergarten, 81 primary (grades 1, 2, & 3), 66 intermediate (grades 4, 5, & 6), 1 Quest, and 10 special education teachers completed the survey for a response rate of 97%. Fifty-three of the 173 teachers included written comments on their surveys. These comments are included at the end of this document.

SURVEY RESULTS: UTILIZING COMPUTERS IN EDUCATION Survey statements 5 and 6 dealt with the teachers' beliefs concerning the utilization of computers in general. Having worked with the computer labs for one year, 90% of the teachers felt that computers can play a valuable role in delivering instruction in the teaching of mathematics and reading. Three-fifths of the teachers stated that computers are a cost-efficient method for delivering instruction. Only 10 teachers felt computers are not a cost-efficient method.

UTILIZING COMPUTERS IN A LABORATORY SETTING Statements 1, 2, 3, 4, and 23 asked for teachers' attitudes and beliefs toward having the computers in a laboratory setting. In general, the teachers appeared extremely satisfied with the lab setting of the computers. Ninety-one percent of the teachers said they were satisfied with the way the lab was being used; 94% said they felt the decision to place the computers in a lab setting was the best choice. Only one teacher disagreed with the decision of placing computers in a lab. About half the teachers thought the lab use needed to be expanded to teach keyboarding and wordprocessing, and 84% said they would like for their students to use similar ESC software in the areas of science and social studies. While the teachers indicated satisfaction with the labs, 69% said they

would use a computer for teaching if they also had one in their classroom. Fewer than 12 teachers disagreed with any of the above statements.

OVERALL QUALITY OF THE ESC SOFTWARE Statements 7, 8, 9, and 10 dealt with the teachers' overall view of the ESC software. Approximately three-fourths of the teachers believed they were aware of the objectives, content, and methods of the ESC software being used in the labs. Also, approximately three-fourths of the teachers felt the decision to use the ESC software was the best choice. More than four-fifths of the teachers felt that the ESC software accomplished for the students what it should be doing. Over half the teachers agreed that the software conformed to their teaching philosophy and priorities, where only 6% of the teachers disagreed.

QUALITY OF THE ESC MATHEMATICS SOFTWARE Statements 11 through 16 concerned the ESC mathematics software specifically. Three-fourths of the teachers felt the ESC mathematics software was consistent with the mathematics content they teach in their regular classroom. Similarly, over half of the teachers felt the software was consistent with the methods they used in their regular classroom to teach mathematics. Forty-five teachers thought that the software had shown them better methods to teach mathematics, thirty-two did not, and the majority (eighty teachers) were neutral. More than two-thirds of the teachers felt the software challenged their students to work at their students' optimum level in mathematics. About half the teachers viewed the software as having improved their students' attitudes toward mathematics, and half viewed the software as having improved their

students' achievement in mathematics. Less than 7% of the teachers disagreed that the software improved either attitudes or achievement of their students in mathematics.

QUALITY OF THE ESC READING SOFTWARE Statements 17 through 22 were specific to the ESC reading software. The survey's results for the reading software were nearly parallel to the results for the mathematics software. Here too, 75% of the teachers felt that the software was consistent with the reading content they taught in the regular classroom. Two-thirds of the teachers agreed that the reading software was consistent with their teaching methods. Almost three-fourths of the teachers viewed that the software challenged their students to work at optimum levels in reading. Approximately the same number of teachers agreed and disagreed on whether the software showed them better methods of teaching reading, with the majority (84 teachers) being neutral on this point. Again, about half the teachers thought using the software had improved their students' attitudes and achievement in reading. And again, less than 9 of the 173 teachers disagreed that the software improved their students' attitudes or achievements in reading.

INTERACTION OF STUDENTS AND COMPUTERS IN THE LABS Statements 24 through 26 dealt with the interaction of the students and computers while in the labs as viewed by their teachers. A large number of the teachers (141) felt that each of their students was "on task" throughout the lab period. About half the teachers thought that the

work their students did in the lab had increased their students' ability to follow directions. The teachers were evenly divided on whether they thought students' attendance was higher on lab days.

COMPUTER LAB UTILIZATION Statements 27 through 31 dealt with computer lab utilization. Only one third of the teachers said that they had requested extra lab time for a specific lesson in mathematics or reading for their class, or for an individual student. However, 69% of the teachers did say they would like more time for their students to use the software in mathematics and reading. Fifty-eight percent of the teachers felt that there were sufficient resources available to ensure their success in using the mathematics and reading software. Finally, 149 of the 173 teachers stated they were willing to work with other staff members and consultants to become more effective in using the software. Only 1 teacher stated an unwillingness to work to become more effective with the software.

SUMMARY As stated in the introduction, for a successful and meaningful change to occur, positive teacher attitudes toward the change must exist. All the data of this survey indicated that the teachers included in this survey have very positive attitudes toward the computers, the labs, and the software.

The teachers were extremely positive with the decision of setting up the computer labs with the ESC mathematics and reading software. They felt that the computers do play a valuable role in the mathematics and reading instruction. An amazing number of teachers felt that each of their students was "on task" throughout the lab period. The ESC software was, in their opinion, very consistent with

their content and methods in mathematics and reading. They believe the software allowed each student to work at the student's optimum level in both mathematics and reading. Additionally, the teachers stated they would like similar software for the areas of science and social studies. Finally, the introduction of the computer laboratories appears to have prevented negative attitudes toward using computers for instruction. A majority of teachers expressed a willingness to use computers also in their individual classrooms.

When all the elementary schools in the district have a computer laboratory, it might be an opportune time to set up additional computers in each school for teachers to use in their own classroom. The introduction of the teachers with the possibilities of using computers for instruction through the laboratories has paved the way for this next step.

The only concerns evident from the survey were with the utilization of the lab time. The teachers stated they wish more time would be available to use the software in mathematics and reading. Two-fifths of the teachers admitted that they have never requested extra time in the lab for either an individual student or their entire class. This could be because of two reasons: they believed there was no time available, or they never knew they could have requested extra time. At some of the elementary schools there are no available lab periods for a whole class due to the school's enrollment. However,

the system attendants need to make the teachers aware that not all 29 computer stations are fully used each lab period. The attendants need to set up a system in each school that allows teachers to efficiently schedule individual students to work on needed assignments in the lab.

Lastly, the teachers in the schools felt very aware of the software's objectives, content, and methods. As a reflection of the teachers' professionalism, almost nine-tenths of them stated that they would be willing to work with other staff members and consultants to become more effective in using the software for instruction. With such teachers' attitudes, beliefs, and dedication, improvements in the instructional program can be expected in the future.

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Assessment of Elementary Computer Labs

A:AGREE N:NEUTRAL OPINION D:DISAGREE U:UNSURE NR:NO RESPONSE

ALL NUMBERS ARE %
N = 173

A	N	D	U	NR	
91	06	02	01	00	1. I am satisfied with the way the computer lab is currently used.
94	06	01	00	00	2. I feel the decision to place computers in a lab setting was the best choice.
69	16	05	10	00	3. I would use a computer for instruction if I had one in my classroom.
53	30	06	10	01	4. In general, I think there is a felt need in my school building to expand the utilization of the computer lab, e.g., teach keyboarding and wordprocessing.
90	07	02	01	00	5. I believe computers can play a valuable role in delivering instruction in the teaching of mathematics and reading.
61	20	06	12	01	6. Computers are a cost-efficient method for delivering instructional services.
82	12	04	03	00	7. I feel the software is accomplishing for the students what it should.
72	19	03	06	01	8. I feel the decision to use this software was the best choice.
74	12	02	11	01	9. I am aware of the objectives, content, and methods of the software used in the lab.
52	32	02	12	01	10. The software conforms to my teaching philosophy and priorities.
75	16	04	04	01	11. The software is consistent with the mathematics content I teach in the classroom.
56	26	09	09	01	12. The software is consistent with the methods I use in the classroom to teach mathematics.
27	47	19	07	00	13. Viewing the software has shown me better methods to teach mathematics.
48	27	06	18	01	14. Using the software has improved my students' attitudes towards mathematics.
46	26	05	23	00	15. Using the software has improved my students' achievement in mathematics.
68	18	04	11	00	16. The software challenges the students to work at their optimum level in mathematics.
75	17	03	05	01	17. The software is consistent with the reading content I teach in the classroom.
66	22	05	06	01	18. The software is consistent with the methods I use in the classroom to teach reading.
72	13	05	09	01	19. The software challenges the students to work at their optimum level in reading.
23	49	19	09	01	20. Viewing the software has shown me better methods to teach reading.
43	28	05	23	01	21. Using the software has improved my students' attitudes towards reading.
51	22	04	22	01	22. Using the software has improved my students' achievement in reading.
84	06	05	05	00	23. I would like to have my students use similar software for science and social studies.
47	28	09	16	00	24. The ability of my students to follow directions has increased because of the work they must do in the lab.
16	32	22	27	03	25. Students' attendance is higher on days students know they go to the lab.
82	08	08	02	00	26. Each of my students is 'on task' throughout the lab period.
69	19	09	02	00	27. I would like more time for my students to use the software in mathematics and reading.
35	20	39	06	00	28. I have requested extra lab time for a specific lesson(s) for individual students.
36	17	43	04	00	29. I have requested extra lab time for a specific lesson(s) for my class.
88	08	01	04	00	30. I am willing to work with other staff members and consultants to become more effective in using the software.
58	15	10	15	02	31. There are sufficient resources available to me to ensure my success in using the software in the teaching of mathematics and reading.
06	48	39	06	01	32. Grade level (a) K, (b) 1-3, (c) 4-6, (d) Special Ed. (e) Quest (mark one)

School Name _____

PLEASE FEEL FREE TO MAKE COMMENTS ON THE BACK OF THIS SHEET.

Fayette Cou' ...ll. Schools
Department ... ervices
7... ...et
Lexi... Kent...y 40502

May 10, 1988

Dear Teacher:

The installation of computer labs in our elementary schools and the implementation of the Education Systems Corporation (ESC) software into the instructional program has been a major step in our school system. The decision by the Computer Committee was a long and involved process. However, we need to follow-up that decision by getting input from you about the labs and software and how it helps in teaching basic skills.

Your school is one of the first elementary schools to have the computer lab with ESC software in place for one full year. In order to plan to evaluate your lab's usefulness we need your opinions.

The attached form should take only 7-8 minutes to complete while you are in the lab with your class. On the back of the form is space for you to write any comments you would like to make. Please use a #2 pencil to mark your answers.

We assure you that your responses will be kept confidential. You should turn in the completed form to your lab attendant and have your name checked off the list. This list is only to make certain each teacher responds.

The results will be made available to the Fayette County School Board, Superintendent, you and your school.

We would be happy to answer, any questions you might have. Please call James Wyrick at 281-0100 ext. 260 or Alan Zollman at 257-2944.

Thank you for your assistance.

Sincerely,

Mr. James Wyrick
Project Director
Fayette County Schools

Dr. Alan Zollman
Research Director
University of Kentucky

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TEACHER ASSESSMENT OF ELEMENTARY COMPUTER LABS

1. "I feel the software has had different approaches to various concepts not always better. I do feel the students need to see different instructional methods to sometime reinforce other methods. Other times it presents the concept in a different way to clarify a concept. We have such a large student population there is little free time for individual or class 'extra time'. I feel we need to make a strong effort to upgrade reading and math before we branch out into science and social studies. Possibly the latter two subject areas could be used with those students who have shown consistent mastery of reading and math skills."

2. "I feel this program has taught independent listening and study skills. It has made them listen without having things repeated. My lower children have progressed further than in the past and I attribute this partly to the computer. I was leary of the loss of time from my regular teaching. I would prefer an afternoon schedule instead of getting up in the middle of a reading group."

3. "Math software on fractions for first grade would be nice."

4. "I have requested specific lessons for my class during our regular lab time. It has worked beautifully."

5. "#15. Will know after testing."

6. "Would truly like to see Social Studies and Science on lessons too. Have not specified individual help, but just really haven't thought about it, I will now that it's suggested. Have plugged the whole class in on lessons."

7. "I am very pleased with the way Mrs. Holbrook arranges lessons to fit my classroom needs and the level of individual students."

8. "Our computer attendant is fantastic. This helps a lot in computer class. Computers have motivated my students. I would like one in my classroom to build on skills learned in lab. This would be a good reward and builder of skills. The math software has been very challenging to my students. All software has helped to build self-esteem. It's great!"

9. "The reason I did not want time spent on social studies and science is that I did not want the time taken away from reading and math- which are basic for first graders. The 'carry-over' from computer to classroom is evident."

10. "I would like a computer in my class for mathematic reinforcement in particular."

11. "I am a substitute, but I am in the classroom a great deal of the time."

12. "#11-Fractions came too early in the year for third grade."

13. "Mrs. Holbrook has been very helpful to work with. As a new teacher I have needed some guidance and she has always been prepared and willing to help me. I feel that it is her knowledge and enthusiasm that makes Cardinal Valley's computer program a success!"

TEACHER ASSESSMENT OF ELEMENTARY COMPUTER LABS

14. "It would be beneficial to have more open periods (if possible) to schedule LogoWriter, etc."

15. "I feel that the computer lab is helpful in working with students in math and reading. However, I would like to have the ability to access other types of software (simulating, etc.) which presently is not available for lab use. Even if a body of software were available, Lansdowne has very few open lab times available. Finally, it would be advantageous to have the ability to run Apple software - much fine material is available (yes, we have one computer with Trackstar, but no one has gotten it to work)."

16. "Our computer lab attendant makes our lab very warm and friendly for the students and teacher. She is very helpful and willing to be honest regarding the software's strengths and weaknesses. The lab has been most helpful with ESL students and other low functioning students that I can schedule daily."

17. "We were told by the company when our lab was installed that the computer would monitor student progress so closely that it would automatically put students back through a lesson. Now we're told that we must make this decision. Rounding of numbers at 4th grade level is poorly done-vague directions and examples."

18. "#4. I do not know. #8 I am not familiar with other software. #13 Different-yes. #14 I don't really see a difference. #15 I do not have statistics to compare with. #17 Some skills are not taught. #21 I can't tell. #22 I can't tell. #23 Definitely! Especially science. Our science program is weak. #26 I have three who do not like to go. 'It is too much work,' they say. #29 Used drawing as a reward. #31 I do not know what a program is like, how it teaches material, until I view it."

19. "I have answered 'B' on some math software questions because my students are just beginning to use the material in question. I am not very familiar with it yet."

20. "Our program here is fabulous. This is due, I feel sure, to the very capable hands and precious, positive working attitude of Harriot. It has been a wonderful experience. I am also a parent of a sixth grader here and can not say enough about the merit of the program. Money well spent. Thank you, as a teacher and a parent."

21. "Please push for social studies. I have seen excellent software. Great need. Voyage of Mimi software great for science. Please correct mistakes-it is very frustrating.

22. "Computer classes were the favorite time of the week for my children. The lessons on the computer were compatible with my teaching of reading and math and were a means of reinforcement. I think we agreed that work needs to be done to eliminate repeating lessons unless it is deemed necessary."

23. " On questions 5 and 6, I feel the computer is a reinforcement aid not an instructional device."

TEACHER ASSESSMEENT OF ELEMENTARY COMPUTER LABS

24. "Questions 11-16 refer to math which I don't teach-students go to another teacher for math. Question 25- I haven't made a comparison. I feel that our lab assistant, Mrs. Collier, has made this a wonderful first year. She has been so helpful to include extra time for individuals who needed extra help. We think she's a great plus to our program.

25. "The software program on negative numbers was confusing. Some programs won't 'take' the correct answer. Higher levels are needed to challenge some students and/or to continue similar programs complete at the 6th grade level.

26. "On #4, this should be done with 4th, 5th, and 6th."

27. "Thoroughly enjoyed working with such a helpful and hard working lab attendant, Linda Means."

28. "Mrs. Means really has done a fine job. She has been very cooperative in scheduling and in assisting the students. Computer lab has been such a pleasant time. Although my class did not work often with Ms. O'Canna I heard many positive comments concerning her work."

29. "My students have really enjoyed all parts of the lab this year!"

30. "As a Kindergarten teacher, I definately feel the students would benefit greatly by having computer lab twice a week! They love it!"

31. "No. 25 Students have been very regular in my class, although, they do love coming to computer class."

32. "By the end of the 1st semester the novelty had worn off-some math methods were confusing-people became bored of just doing math and reading. Many students put any anwer down-just to get through a lesson."

33. "I think the lab is excellent for <u>all</u> students, including Special Ed. children. I hope the program expands and becomes available for every school. It enables the advanced student to work ahead and cover more difficult material to maintain interest, challenges in math and reading. Super Program!"

34. "The children should be taught the proper hand position!"

35. "I think computers are a cost efficient method for supplementing instructional services. It can be great to help support and supplement what the students have already learned. It helps encourage more comprehensive reading and paying closer attention to directions."

36. "I would like to see the computers expanded to track keyboard, and BASIC computer programming. I would like to have 1 or 2 or more computers in my classroom for children to use for writing reports, etc."

37. "Some lessons have poor directions and are hard to follow to answer correctly. Often it is difficult to understand how the answer was obtained."

TEACHER ASSESSMENT OF ELEMENTARY COMPUTER LABS

38. "Excellent program for the students. I strongly agree that Science and Social Studies should also be in the computers for the children. If at all possible I would like to see a full ½ hour for the time. It seems like we are only starting when time is over. Lab attendant has done an excellent job with the students. Very caring and this has made the children feel good when in the lab!"

39. "In this age of computers, giving students opportunities to work and feel comfortable with computers is reason enough to have the program."

40. "24-I think we see a big improvement in the students ability to listen and follow directions, over the next years, as a result of the computer lab. #25-My attendance is always good but my children love to go to the lab on our designated days and 'moan and groan' when the lessons are ended."

41. "Debi has done a super job-both with the lab and the students!"

42. "My Kindergarten children love going to the computer lab. They have made remarkable progress in their usage of the computers."

43. "Some students progress more rapidly and could use more difficult tasks-too much drill and pratice for those students. Logo type for some children set up own- write own, etc. Consider the lab a valuable asset-would like to have one for my classroom."

44. "Computer lab would be much more effective if children were working on the same things at the same time as in the classroom. Language Arts/Math lab time with LA/M classroom frames would be best."

45. "I feel once a week is enough time for kindergarteners to use the computer. I would rather leave them disappointed that the (one) class has ended rather than schedule more time and leave them saying-'I'm glad that's over' and 'I'm tired'. Our time is just enough-it leaves them interested instead of weary. In other words-don't overkill it! I love the program. It has been very beneficial to my children. They love to come to the lab. The software is great."

46. "Mary Todd is fortunate to have Mrs. Spencer as our lab consultant. She has done well with the students this year. Thanks.

47. "#15-It seems to be far behind my teaching skill area."

48. "#24-Hard to judge."

49. "Some of the letters are not correctly formed (correct size)."

50. "I am satisfied with the computer lab right now. As time goes on, as I know more about software and what can be done with the computers I would like to see an expanded use of the computer. I am not as familiar with computers and our software as I would like-no one's fault-lack of time is the culprit."

51. "Some lessons follow too much of a workbook format. I'm afraid as soon as the newness of the computer itself wears off, the students will be less eager to come to lab. I have seen this attitude developing this year in my class. I want the computer to extend my activities in the room and not duplicate them."

TEACHER ASSESSMENT OF ELEMENTARY COMPUTER LABS

52. "There is no place to answer questions 28, 29, 30, 31 which require a yes or no answer. The computer lab needs to be in one central room with proper air and light. In order to decide improvement in teaching methods or attitude there must be some form of before and after evaluation. Teachers need to be more familiar with the software and curriculum."

53. "As a Special Ed. teacher, I need a different kind of reporting system. I need even more information about how the students' performance is in each lesson. I also need inservice on curriculum objectives (content) of each unit. I think I could coordinate my lessons w/the computer lessons. I would also like to have the computer lessons used regularly as drill and practice for my lessons. This would be much more effective for my stuents."