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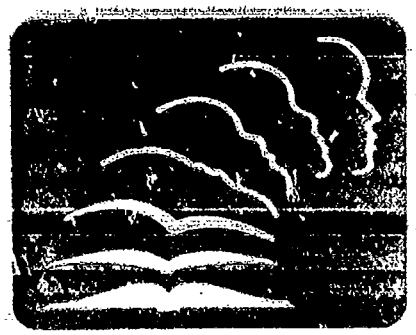
ABSTRACT

A 6-month study examined the attitudes of older, low-literate adults toward using computers to learn to read and tried to determine the effectiveness of Penn State Adult Literacy Courseware for beginning readers with older, low-literate adults at a community-based senior center. The students were 10 black adults, aged 66 to 86 and educated at the 2nd- to 11th-grade level. They were tutored by 10 females, 8 of whom were black, who ranged in age from 64 to 72. All tutors were educated at the secondary level or beyond, seven of them had tutored before, and three said that they had had some experience using computers. The Attitudes toward Computers for Reading Instruction questionnaire and the Slosson Oral Reading Test (SORT) were used as pre- and posttests. The tutors were trained in the courseware before working with the students. The range of actual instructional hours was 6 to 19, and only 7 tutor-student pairs were active at the end of the study. No strong conclusions about the effectiveness of the courseware and the attitudes of the students can be made, due to the absence of a control group and the small sample size. Gains on the SORT occurred for all but two of the seven students. The mean gain was 2 months. Overall, changes in the students' attitudes toward computer-assisted reading were in a positive direction. (CML)



INSTITUTE FOR THE STUDY OF ADULT LITERACY

COMPUTER-ASSISTED INSTRUCTION IN BASIC SKILLS FOR OLDER, LOW-LITERATE ADULTS

FINAL REPORT

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COMPUTER-ASSISTED INSTRUCTION IN BASIC SKILLS FOR OLDER, LOW-LITERATE ADULTS

Introduction

Addressing the problem of illiteracy among older adults is becoming increasingly important as that segment of society grows in size and in proportion to the overall population. According to the United States Bureau of Census (1986), an estimated 33.2 percent of adults 65 and older have not attained an education beyond the eighth grade. It is projected that the population of adults 65 and older will increase to over 31,500,000 by 1990 (United States Bureau of Census, 1986). As the population increases, concerns about the degree of literacy in older adults increase, especially in a society which demands increasing levels of education to survive.

The task of defining illiteracy is a difficult one. Those who cannot "read, write, compute, solve problems, communicate or perform other basic intellectual functions well enough to. . . participate in the challenges of everyday living in an increasingly complex world " may fall into that category (Chisman, 1989). Approximately 20-30 million Americans have serious problems with one or more of these skills (Chisman, 1989). It is estimated that 10 to 50 percent of all adults over 60 are functionally illiterate (Lumsden, 1979).

The task of defining the literacy needs of older adults is difficult. According to Rigg and Kazemek (1983), adult educators and material developers often make assumptions about those needs. More research, such as a project carried out by Forlizzi and Askov (1987), is needed to assess the educational needs and interests of the older adult so programs and materials can better address those needs.

Since we are in a society of rapid technological change, researchers are beginning to investigate how older adults respond to technology, in particular to computer-assisted instruction (CAI). Over the last 20 years, computers have been introduced extensively at the primary, secondary and post-secondary level as an instructional aid (Flynn, 1989). Many CAI programs have been developed to enhance reading and writing skills. Research investigating how computers can be used with older adults, as well as the attitudes older adults have towards computers, is just beginning to emerge. A pilot study conducted by Forlizzi and Askov (1987) showed that older adults expressed an interest in using the computer to learn to read and write.

The Penn State Adult Literacy Courseware is a CAI program designed to teach sight-word vocabulary to beginning adult readers. The Courseware was found to be effective with parents of Chapter I children (Askov, Maclay & Bixler, 1987) as well as with displaced workers (Bixler & Askov, 1988). These special groups, however, included adults much younger than 65. Of interest would be the use of the Penn State Adult Literacy Courseware with older, low-literate adults.

Purpose

This six-month pilot study evaluated a program of computer-assisted literacy instruction for older, low-literate adults at a community-based senior center. The purposes of this project were 1) to determine whether the Penn State Adult Literacy Courseware, previously shown to be effective with low-literate adults, could be used effectively with older, low-literate adults, and 2) to determine attitudes of older, low-literate adults towards using the computer in learning how to read, both before and after instruction with the computer.

Description of Center in the Park

Center in the Park is a community-based senior center in northwest Phila.elphia. Founded in 1968, the Center's goal was to enable older people to have a fuller and richer life. It continues to strive towards that goal today. The Center has close to 3,000 active members and is staffed by full-time and part-time employees, part-time senior aids, and volunteers. Over 80 percent of the active members of the Center are Black, over 80 percent are women, and 86 percent are 65 or older.

Center in the Park provides access to a network of supportive services and activities for older adults. Services in counseling, health awareness, and arts and recreation are provided at the Center. In addition, the Center has developed in-house volunteer literacy programs using literate seniors trained in literacy methods and materials as tutors for low literate members of the senior center. The Center also provides the opportunity to take classes in beginning Spanish and to obtain a diploma through a General Educational Development (GED) course.

Description of Participants

Students

Ten members enrolled in the Center's literacy program initially agreed to participate in the project. Of the ten, three were males and seven were females. All ten participants were Black. Three of the participants were married, six were widowed, and one was divorced. They ranged in age from 66 to 86. The highest grade level of education attained was second for two students, third for another student, eighth for four students, tenth for one

student and eleventh for another student. These participants held jobs as assembly line/factory workers, heavy equipment operators, child care providers, and domestic workers. Most are retired now.

Some participants had joined the program to learn to read and write better. Other students said they wanted to learn how to use the computer. Still others said they previously had an illness of some kind and wanted to improve their reading and writing skills.

Tutors

Ten members of the Center initially agreed to be tutors. All tutors were female and ranged in age from 64 to 72. Eight of the tutors were Black and the remaining two were White. All tutors were educated at the secondary level or beyond, and were retired from a variety of occupations.

The tutors were asked to provide information about their past experience in volunteer work, and tutoring and with computers. All tutors had volunteered their services for a variety of activities. Seven had tutored in the past. Three of the tutors said they had some prior experience with the computer.

Materials/Equipment

Apple IIGS

An Apple IIGS (donated by the Apple Corporation) was used in this project. Additional equipment included one color monitor, one five and a quarter inch disk drive, one three and a half inch disk drive, an Echo GP speech synthesizer, and an ImageWriter II printer.

Penn State Adult Literacy Courseware

The Penn State Adult Literacy Courseware is designed for adult beginning readers. Using state administrative funds from Chapter I, the courseware was developed beginning in the Fall of 1984 at the Institute for the Study of Adult Literacy. Further funding from Chapter I and 310 Adult Basic Education Special Projects enabled the project to be completed in 1986 (Askov, Maclay, & Bixler, 1988).

The courseware uses a "whole word" approach along with various activities to teach 1,000 high frequency and functional words. Each of its six modules has a specific purpose. Module 1 provides an introduction to the courseware and allows one to become acquainted with the computer. Module 2 (picturable words) contains wordsets with words that are introduced with a graphic representation of the word. Module 3 (non-picturable words) contains wordsets that are introduced with a short story selection. Module 4 teaches words related to application materials and allows one to practice completing a typical application form. Module 5 contains basic and survival words based on frequently occurring spelling patterns. Module 6, a word processor, allows one to practice writing many of the words learned in earlier lessons. Modules can present lessons, tests, or games. Other features allow one to create or modify lessons, tests, or games.

Slosson Oral Reading Test (SORT)

The Slosson Oral Reading Test (Slosson,1963) is designed to measure word-recognition skills. The SORT is an individually administered test which requires an individual to pronounce words in a graded list. There are ten graded lists that range in difficulty from pre-primer to high school level. The test takes approximately ten minutes to administer.

Attitude Questionnaire

To assess attitudes the *Attitudes Toward Computers for Reading Instruction* questionnaire (Askov & Brown, 1987) was administered to each of the participants. This is an eighteen-item questionnaire concerned with adults' attitudes about computer training, use, and effectiveness for reading and writing instruction. Participants can either read or listen to questions being read to them and respond accordingly.

Procedure

At the start of the project, the project coordinator met with the site coordinator and other personnel at Center in the Park to discuss and plan for the project. The site coordinator, along with another staff member, administered the SORT and the Attitude Survey to each of the students prior to instruction.

In the first training session, tutors were given a thorough description of the project, their duties, computer use, the courseware, and record-keeping. Tutors then practiced using the computer and courseware. The site coordinator provided assistance as needed. The tutors were instructed to work with their assigned students on the courseware, allowing students to select from a variety of wordsets. The tutors were asked to work with the students for a minimum of 20 hours of instruction and keep a log indicating wordsets used as well time spent at each session.

During the instructional period, two other training sessions were given to provide additional information about the project and courseware as well as address issues concerning technical questions. After the student instruction

period, the SORT and the Attitude Survey were readministered to assess changes in word recognition skills and attitudes.

Results

At the beginning of the project, ten student/tutor pairs were active. By the end of the project, only seven were active. Two tutors discontinued because of health problems; the other tutor/student pair were inappropriately matched. The SORT results presented include the seven students who completed the study. The results of the Attitude Survey (see Appendix) include the responses of the original ten participants who responded to the scale before instruction and the responses after instruction of the seven participants who completed the project.

SORT Results

SORT pre-test scores ranged from a grade level of 1 year 2 months (14 months) to 5 years 8 months (68 months). The project guidelines stipulated that each participant was to have 20 hours of instruction before post-testing. However, due to factors such as limited time period, personal or family illness, bad weather, transportation problems, as well as occasional hardware problems, the participants were not able to attain 20 instructional hours before post-testing. The minimum amount of hours of computer instruction for the participants was 6 and the maximum was 19. Results of the post-testing revealed that grade levels ranged from 0 years 6 months to 6 years 3 months (75 months). Table I presents these results.

TABLE I

Subject	Hours of instruction	Pre-Sort* scores	Post-Sort* scores
1.	6	4.0	4.7
2.	14	5.3	5.6
3.	11	5.6	5.8
4.	13	4.1	3.7
5.	18	5.8	6.3
6.	19	3.6	4.2
7.	6	1.2	.6
MEAN		4.2	4.4

*Scores are represented by grade levels

The results show that gains occurred for all but two students. The mean gain was 2 months. Due to the small number of subjects and the fact that no students were available to serve as a control group, the increase may be attributed to factors other than instruction with the courseware. However, there was change in a positive direction for most students and for the group as a whole.

Attitude Survey

The following provides a summary of the responses to the Attitude questionnaire. A list of before and after responses to each question is provided in the appendix. Of the seven students who completed the study, all changed at least one of their responses (in a positive direction) to the survey

after instruction with the computer. One participant initially said that she was not sure if it were important to use computers for reading and writing; after training, she felt it would be important. Two participants changed their responses to indicate that others would think more highly of them for using the computer. Another participant agreed that computer knowledge could help with writing after she initially stated that s e was not sure the computer could help. Two participants stated initially that they were afraid to use the computer, but changed their responses after instruction. Three participants who first thought they could not become better readers by using the computer said, after instruction, that the computer could help them become better readers. Four participants who initially stated that learning to read from a computer may be harder than learning to read from a book changed their responses after instruction. One participant who originally said that using the computer was a waste of time , had a more positive response after training. Lastly, one student stated that using the computer for reading and writing was a good idea after initially saying that it was not.

Overall, the participants appeared to enjoy using the computer as an aid to enhance reading and writing skills. In a discussion with participants, some commented that they were "excited about using the computer" and that the computer "was a big help and made a difference." One participant commented that using the computer was "more exciting and helpful" because it gave "many examples" and told "you when you were doing a 'Good Job.'" Occasionally, the participants became frustrated, but persisted in their efforts. For many of the participants, this was the first opportunity they had to use the computer. They did not want it to be their last.

Tutor attitudes and comments

The tutors were asked to provide feedback concerning the project and the courseware. The tutors generally responded positively to the project and to working with the courseware. They indicated that the project provided an opportunity to help others. It also gave many of them the opportunity to learn how to operate the computer for the first time. Many admitted learning to operate the computer and courseware was difficult; however, they were diligent in their efforts. In fact, one tutor commented that she "would not let the computer beat her". The tutors expressed an interest in continuing their work with the computer.

The tutors were asked to comment on the courseware. All tutors indicated that it was occasionally difficult to understand the ECHO GP speech synthesizer; it was particularly difficult for some who had mild hearing loss. Some tutors said that it was difficult to visually distinguish some letters, such as "m" and "w". Some commented that the program moved too slowly, while others thought the pace was appropriate for their needs. All tutors agreed that understanding written directions and executing the program were difficult at times. However, all tutors enjoyed the variety of wordsets available and the versatility the courseware, as well as the reinforcement for correct student responses provided throughout.

Conclusions

The purposes of this study were 1) to determine whether the Penn State Adult Literacy Courseware could be used effectively with older, low-literate adults, and 2) to determine attitudes of older, low-literate adults towards using the computer in learning how to read both before and after instruction with the computer.

Results indicated that SORT scores increased after instruction for most of the students and for the group as a whole. These results are consistent with those found in other studies (Askov, Maclay, & Bixler, 1987; Bixler & Askov, 1988). No strong conclusions about the effectiveness of the courseware with this population can be drawn, due to the small number of subjects and the absence of a control group. Yet, this pilot study was a first step towards investigating the potential usefulness of the Courseware with older, low-literate adults. The results encourage a larger study to investigate fully the Courseware's effectiveness with this population.

This study also investigated changes in attitudes toward using the computer by older, low-literate adults after exposure to the computer. Overall, changes to questions were in a positive direction. Student responses indicated that using the computer was interesting and not a waste of time. Responses also revealed that the students enjoyed using the computer for reading and writing instruction and would like reading and writing better if they could use the computer. Students emphasized that it was important to have the assistance of a tutor when using the computer. Students also indicated that family and friends were proud of their work. Most importantly, the students were proud of their own work.

In this pilot study, the majority of the students and the tutors were exposed to the computer for the first time. Not only were they given the task of learning to run the courseware, they also had to master the challenge of operating the computer. Given such a short period of time to meet these challenges, both students and tutors put forth persistent effort. Given the opportunity, older adults may find that CAI could be used as a tool to enhance literacy skills. Further research would allow more investigation of the issues concerning older adults and how CAI may be used to address these issues.

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Appendix

Attitude Survey

The following is a list of responses to the attitude survey before and after instruction.

1. Is it important for you to learn how to use the computer for reading and writing?

Before Instruction: All but two of the students agreed that it was important to use the computer for reading and writing. The other two students said that they were not sure about its importance.

After Instruction: All students agreed that it was important to use the computer for reading and writing.

2. Does the thought of using the computer for reading and writing make you feel nervous?

Before: All of the students said the thought of using the computer for reading and writing did not make them feel nervous.

After: As before, all students continued to say that the computer did not make them feel nervous.

3. Would using a computer for reading and writing make other people think more highly of you?

Before: Half of the participants said that using the computer for reading and writing would make others think more highly of them. The others said they were not sure how other people would feel about them.

After: While one student said that using the computer for reading and writing would not make others think more highly of him, others thought that it would.

4. Would your family be proud of you if you learned how to use the computer for reading and writing?

Before: All but one of the students said that their families would be proud.

After: All students said that their families would be proud.

5. Could a computer help you to learn to write better than you write now?

Before: Six students said that the computer could help them learn to write better, three students were not sure, and one student thought it would not help.

After: All students said that the computer could help them learn to write better than they write now.

6. Would you read and write more often, if you could use a computer for instruction?

Before: Nine students stated they would probably read and write more often if they could use a computer for instruction. One student did not know.

After: All students said they would now use the computer to read and write more often if they could use the computer for instruction.

7. Would you be afraid to enroll in a reading and writing program that uses computers for instruction?

Before: Two students stated they would be afraid to enroll in a program that uses computers for instruction; eight students said they would not be afraid.

After: All students said they were not afraid to enroll in a program that uses computers for instruction.

8. Could the computer help you to become a better reader?

Before: Six of the students said that the computer would help them to become a better reader; the other students were not sure.

After: All students stated that the computer would help them to become better readers.

9. Would learning to read from a computer be more difficult for you than from a book?

Before: Three students said that learning to read from a computer would not be more difficult than learning to read from a book. The other students were not sure.

After: All students thought that learning to read from a computer would not be more difficult than learning to read from a book.

10. Would you feel confident or sure of yourself in using a computer for reading and writing?

Before: Six students said they would feel confident; three students were not sure, while one student did not feel confident.

After: All but one student said they would feel confident in using the computer for reading and writing.

11. Would you prefer to have a person rather than a computer teach you reading and writing?

Before: Two students said they would not prefer a person over a computer to teach them, while two students said they would; other students said they were not sure or that both tutor and student were needed.

After: All students indicated that they would prefer using the computer and the tutor to help teach reading and writing skills.

12. Is it a waste of your time to learn how to use the computer for reading and writing?

Before: Eight of the participants said it was not a waste of their time; one participant was not sure and the other thought that it would be a waste of time.

After: All students said that learning to use the computer was not a waste of time.

13. Do you think you would like to use a computer for reading and writing?

Before: Nine of the participants said they would like to try using the computer for reading and writing while one said they would not.

After: All students said they would like to use the computer for reading and writing.

14. Would you like reading and writing better now if you could use a computer?

Before: Eight participants said they would like reading and writing better if they could use the computer. One student did not think the computer would help and one response was missing.

After: All students said they would like reading and writing better if they could use the computer.

15. Would reading and writing on the computer be boring to you?

Before: All participants said that it would probably not be boring.

After: All but one of the students felt that the computer would not be boring. One student said it was boring because progression through the program was slow.

16. Would you like your teacher/tutor to use the computer for reading and writing instruction?

Before: Nine of the participants said they would like to have their instructor use the computer for reading and writing instruction. One student was not sure.

After: All students said they would like their instructor to use the computer for reading and writing instruction.

17. Is it a good idea for you to use the computer for reading and writing instruction?

Before: Nine participants said it would be a good idea to use the computer for reading and writing instruction and would try it. The other participant said it was not a good idea.

After: All participants said it would be a good idea to use the computer for reading and writing instruction.

18. Do you think learning to read and write on the computer would be interesting?

Before: All participants said it would be interesting to learn reading and writing on the computer.

After: As before, all participants said they thought it would be interesting.