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ABSTRACT

The Penn State Adult Literacy Courseware project uses a "whole word" approach with some word-building activities in teaching 1,000 high frequency and functional words to adult beginning readers whose children participate in Chapter I programs. The aim of the project is to counteract the intergenerational effects of illiteracy. The courseware runs on an Apple IIe microcomputer and is interactive, branching, and responsive to the user's answers and needs. The objectives for the 1986-87 fiscal year were: (1) summative evaluation and monitoring of the courseware in parent literacy sites; (2) revision of the teacher's manual to include various models for using the courseware in parent literacy sites; (3) further development of teaching activities to facilitate the transfer of words recognized on a computer screen to recognition in print; and (4) completion of the interactive audiodisk version with formative evaluation in sites serving non-native speakers. In meeting the first objective, a group of parents and their children participated in the program. Comparison of pretests and posttests indicated that the 52 parents completing 20 hours of instructional time gained more than 1 year in reading level, compared to at least 50 hours of instructional time to make comparable gains in traditional programs. The remaining three objectives were met. Teachers in the program have noted significant attitudinal shifts in both parents and children. (RS)

INSTITUTE FOR THE STUDY OF ADULT LITERACY

FINAL REPORT

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FINAL REPORT

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FINAL REPORT
Penn State Adult Literacy Courseware:
Impact on Parents and Children

Report to the
Pennsylvania Department of Education,
Chapter I

Introduction

The Pennsylvania Department of Education, Division of Federal Programs obtained permission to use state administrative funds for parent literacy in Chapter I beginning in 1983. The number of children from the same family in Chapter I compensatory education programs was of specific concern. Informal observation indicated that not only do siblings tend to be identified for Chapter I services but also that their parents appear to lack functional literacy skills, such as writing absentee excuses for their children.

Thomas Sticht and other researchers (see References) point to the intergenerational effects of illiteracy. Children whose parents do not read--or who read only marginally--lack the role model provided by a literate parent. They also lack early exposure to reading by not having stories read to them by a parent. It has been well documented that children who are read to as preschoolers do better in school than those with no exposure to reading before entering school.

Furthermore, functionally illiterate parents are unable to help their children with schoolwork. Because they may be embarrassed and insecure about their own literacy skills, they may brush off their children when they seek assistance. The children may interpret this behavior to mean that the parents think school is not important. In some cases parents have had very bad school experiences and, in fact, are negative as well as fearful about

school--the place where they experienced failure. These attitudes are usually passed on to their children.

Chapter I programs have made great strides in the past twenty years in providing compensatory education for children. However, the enormous influence of the family can lessen or even defeat program effects. These children's parents lacked access to the special instruction that they may have needed in school. Therefore, to have the greatest impact, a "whole family" approach to education makes sense as the best approach to teaching children. In response to this concern, the Penn State Adult Literacy Courseware project was begun.

Computer-assisted instruction (CAI) courseware was developed during the 1984-86 fiscal years with funding from the Pennsylvania Department of Education, Chapter I and 310 Adult Basic Education Special Projects. This courseware uses a "whole word" approach with some word building activities in teaching 1,000 high frequency and functional words to adult beginning readers. The goal is expanded word recognition for adult non-readers. The courseware is interactive, branching and responding to the user's answers and needs. The courseware runs on an Apple IIe microcomputer with two disk drives, color monitor, printer, and a speech synthesizer (Echo GP). The courseware consists of 28 disks which deliver the instructional program and record student responses.

The courseware begins with a module on computer usage, especially designed to acquaint the student with the speech synthesizer, the commands and the letter/number keys. Reading vocabulary has been divided into two categories: picturable words (Module 2) and nonpicturablewords (Module 3). These are further divided into lessons (of ten words). Picturable words are introduced with a graphic while nonpicturable words are introduced with

short selections on a variety of topics. The words are taught in context using the speech synthesizer with multiple choice and completion exercises to practice recognition of the target words. Games are used to reinforce the identification of new words.

The student is pretested before each lesson with 90% set as mastery level. If mastery is not attained, the student is directed to the instruction and games to help him/her learn the target words. The student is posttested upon completion of the lesson and/or games. Five forms of each test exist. The courseware uses branching to permit review and reinforcement. An elaborate record-keeping system records and analyzes responses, number of attempts and response time. A file editor disk allows the instructor to monitor the student's progress.

Module 4 teaches 140 words commonly found on application forms of all types. The student practices this vocabulary by completing an application form with his/her own data which may be printed as a reference. Module 5 teaches 170 words which are based on high-frequency phonograms. This module gives practice in word building with consonants being added before 16 common word patterns (such as "ake"). Module 6 (a word processing module) allows the student to use the words s/he is learning in writing activities. It is recommended that this module be used concurrently with the other modules. In addition, Modules 3 and 6 can be customized by the teacher to include his/her own words and sentences.

Objectives: 1986-87

The objectives for the 1986-87 year were as follows:

1. Summative evaluation and monitoring of the courseware in parent literacy sites.

2. Revision of the teacher's manual to include various models for using the courseware in parent literacy sites.

3. Further development of teaching activities to facilitate the transfer of words recognized on a computer screen to recognition in print.

4. Completion of the interactive audiodisk version (using a human voice) with formative evaluation in sites serving non-native speakers.

Each of these objectives will be discussed separately.

Objective 1: Summative Evaluation of Impact on Parents

By a variety of methods, the Chapter I teachers contacted parents of children currently receiving Chapter I services. These parents were invited to participate in the program. Of those who were contacted, 92 eventually were tested for reading level/skill. They had to score below a fourth grade reading level to qualify for the experimental program. Of these, 52 completed the required 20 hours of instructional time (which usually took about three months) and were given all of the evaluation measures. The 40 who are not reported in this study were either unable to complete the required 20 hours or were not tested on all of the measures. A variety of demographic data was kept on the parents. Although giving such information was purely voluntary, most of the parents agreed. We are, therefore, able to more clearly define our experimental group.

Within our sample, there were 37 mothers and 19 fathers. The range of ages was from 29 to 52 with 35.6 being the mean age and 33 being the median age. Of the sample, 67.9% were caucasian, 21.4% were black, and the remaining 10.7% were of other racial backgrounds. Of these parents, 37.5% lived in urban settings with 62.5% living in rural settings. English was the home language in 75% of the homes. Of those reporting a language other than English as the home language, Spanish was the predominant second

language. 10.7% of the parents reported having visual problems and 3.6% reported auditory problems. Only 8.9% reported having any previous computer experience.

Within our sample, 29.7% had graduated from high school, 21.6% had completed only the 11th grade, 13.5% had completed only the 10th grade, 2.7% had completed only the 9th grade, and 32.4% had dropped out of school prior to completing the 9th grade. Of these parents, 51.4% had been in some type of regular program/classroom in school while 48.6% had been in a special education program. When asked why they had left school, 22.2% cited economic reasons, 13.9% cited pregnancy or marriage as the reason, 36.1% said they were frustrated by school, and the remaining 27.8% cited a variety of other reasons.

When asked why they had been interested in this program, 71.1% said they simply wanted to learn how to read or to improve their reading, 18.4% said they wanted to help their child/children, 2.6% said they were interested in the computer, 5.3% said they wanted to learn more English, and 2.6% cited a variety of other reasons for enrolling in the program. Most (86.3%) had never attended any other adult basic education or literacy programs. Of those who had previously attended other adult basic education/literacy tutoring programs, 2% had attended for 3 years or more, 6% had attended for at least 2 years, 4% had attended for at least 1 year, and 88% had attended for less than 1 year.

After interviewing for the descriptive information, the parents were pretested for reading skill/level. This testing involved the Slosson Oral Reading Test (SORT), two sections of the Baltimore County Design (BCD), and the Bader Reading and Language Inventory. After testing for reading skills/level, the parents were then able to use the courseware. They first

used Module 1 which introduced them to the formats, activities, and the voice used throughout the courseware. They were then either allowed to choose a lesson or were assigned to a lesson by the teacher. The teachers were encouraged to use the courseware for approximately 80% of the instructional time and to supplement that with additional activities. Extensive records of student responses and response time were kept on the student data disks. Each teacher was instructed to posttest the parent after twenty hours of instructional time. The posttesting used the same instruments as in the pretesting phase.

In addition to the the experimental group, data were also kept on a control group. This group consisted of parents who were interested in using the courseware but because of scheduling problems, transportation, child care, etc. were unable to participate at this time. This group, although smaller than the experimental group, allowed us to make some comparison statements concerning the effectiveness of the courseware. Complete data were available on 24 of these parents. The mean pre/posttest scores for both groups are shown on the following tables:

Results of the SORT

	N	Pre/M	SD	N	Post/M	SD
Exp. Group	52	3.26	2.00	52	3.93	2.05
Control Group	24	2.74	1.92	24	2.67	1.85

Results of the BCD-E2
(Words in Isolation)

	N	Pre/M	SD	N	Post/M	SD
Exp. Group	52	18.48	5.73	52	22.33	3.85
Control Group	24	17.13	5.04	24	16.88	4.79

Results of the BCD-E3
(Words in a Functional Setting)

	N	Pre/M	SD	N	Post/M	SD
Exp. Group	52	20.13	5.35	52	22.67	3.15
Control Group	24	16.00	6.22	24	16.13	5.95

Results of the Bader

	N	Pre/M	SD	N	Post./M	SD
Exp. Group	52	2.33	1.80	52	3.63	1.76
Control Group	24	2.04	1.73	24	1.79	1.91

The pretest and posttest scores of both groups were analyzed using analysis of variance for repeated measures. This type of test allows a researcher to look at the interaction between time of measurement and treatment (Borg and Gall, 1983). It is used to decide whether the difference between the pretest and posttest means of the experimental group is significantly greater or less that the difference for the control group. With an alpha value set at 0.05, we found significant differences between the pre/posttest scores for the experimental group in all four cases and no significant change for the control group in any of the four tests. The experimental group had gained more than one year in reading level in only 20 hours of instructional time; traditional programs usually take a minimum of 50 hours to make comparable gains.

Summative Evaluation: Children

Although no direct involvement by the students was mandated, it was hypothesized that interest in learning to read by the parents should have a positive effect on the children. Therefore, pretest and posttest data for these children were compared with pretest and posttest data from other children in the Chapter I program. The results of this comparison are not yet available but will be added as soon as they are completed.

In addition, we hypothesized that attendance patterns of the children might change as a result of the parents involvement in school. Attendance data were collected for the three months prior to the parents involvement in the program and the three months immediately after the parents became involved in the program. Although no statistical comparison was done with a control group, the change in percentage of days attending school is quite interesting. Prior to the parental involvement in the program these children were in school an average of 88 days out of 100 while after parental involvement they were in school 95 days out of 100. In view of the correlation between attendance and achievement, this statistically significant change from 88% to 95% in attendance is an important change.

Models for Use

With a variety of sites, teachers and adult students, it was inevitable that the ways of using the courseware would also vary. Some methods were more successful than others. Although the success of a particular model may have been influenced by the specific location or individual, some generalizations can be drawn from the experiences of these teachers. These generalizations have been added to the Teacher's Manual. They can be found in the section entitled "Models for Use" which is found in the "Introduction".

Reinforcement Activities

Similarly, a variety of activities were used by the teachers to facilitate the transfer of words recognized on the screen to recognition in print. Activities were also used to improve comprehension of words/passages from the courseware. Many teachers used writing activities involving the word processing module. Examples of these activities have also been included in the revision of the Teacher's Manual. They can be found in Appendix L.

A monthly newsletter was published and sent to all of the participating teachers. It included some supplemental ideas, information on the courseware, and a variety of other articles. (Copies of the newsletters can be found in the Appendix at the end of this report.) In addition, a Supplement to the Teacher's Manual has been prepared. This contains all of the sentences and selections found in the instructional sequences of the courseware. Having a hardcopy of this will enable the teachers to more easily create reinforcement activities. (A copy is submitted to the funding agent with this report.)

Interactive Audiodisk Version

The Interactive Audiodisk version of the Penn State Adult Literacy Courseware has been completed. The primary difference between this version and the original synthesizer version is the use of true human speech. This consists of 28 double-sided 5 1/4" computer disks and 14 Audiodisk disks. Each Audiodisk has a capacity of 48 minutes; thus, there are approximately 11 hours of recorded speech used in this version. In all other aspects, this version is identical to the synthesizer version.

In the process of completing this version, any software bugs found by the Instructional Designer or reported by the teachers were corrected.

Conclusions

Consider this description (provided by a Chapter I reading teacher) of a low-literate parent involved in a computer-assisted instruction program within her daughter's school:

> *During our first meeting Mrs. Glance was extremely cooperative. She was quite anxious and eager to work with the Reading Department and further develop her skills. "I'll do anything to help my kids," she commented frequently. Her eagerness and spirit were welcomed.*
>
> *Angela, her oldest child and my Chapter I student, sat in our sessions. Angela reassured her mother. Although Mrs. Glance was excited to be learning, it was clear that she lacked confidence. "I've never been too good at school work," and "I could mess up anything." She would express such feelings repeatedly. I reassured her and it seemed to be effective. Slowly, she was able to relax and enjoy -- and enjoy she did.*
>
> *As a result of her lack of confidence we worked slowly -- together -- all three of us. I truly enjoyed the experience. After several sessions, I felt very comfortable with Mrs. Glance and feel strongly that she too felt good about the program.*
>
> *During the pretesting she was tense. Her voice changed and she was cautious. Upon mentioning the correct word (a slip on my part), she cringed. Slowly, she began to respond.*
>
> *The next series of sessions were fun. We became buddies. She was changing. She asked her daughter to remind me about computer class. With each session I could see attitudinal changes In the early session, she kept saying, "I could break anything. Do you trust me?" Once I made a mistake, and we laughed. Then she seemed to relax. My computer was a pleasure for her once she felt comfortable and at ease.*

Even though we had problems with incompatible schedules and illnesses, I feel sure she made gains in reading ability. Her self-esteem definitely was raised.

Also, consider this description of her daughter, a senior high school student:

My observations have led me to conclude that Angela has shown improvement since her mother's involvement in the program. Angela's somewhat rough attitude mellowed. She became more relaxed and independent. During a hectic class period, Angela would get boisterous quickly. Recently, I've noticed her attitude has calmed.

Angela is now reading more independently. During the first nine weeks, I had to fight her to do a book report. This nine weeks she handed her report in two weeks early. WOW! What a change! Angela's study habits changed, also. She utilized her free moments more and seemed to ask questions.

These observations were made by a reading specialist who teaches in a Chapter I program in a western Pennsylvania high school. Many of the teachers have made observations similar to those cited above. A teacher in a junior high school in western Pennsylvania says about one parent:

Joe eagerly worked on the computer and enjoyed printing out his responses. We made our own word bank on the word processor (Module 6). He loves to write his own stories.

Still another example from an administrator of a western Pennsylvania school who reports that one of his rather obese parents says:

...she likes the program better then eating! She is such a willing learner. She was so proud that she had her daughter tell her (the daughter's) teacher that her mother was going to a computer class.

These are but a few of the comments we continue to receive from the teachers.

This is not to imply that getting started was easy. Very few of the teachers had had experience working with adults. Many had little or no experience with computers. Most of them were very hestitant to attempt the task of recruiting parents to work in the program. Aware of these problems, the Institute offered workshops to all of the teachers. Nancy Woords, Coordinator of the Institute's field laboratory at the Penn State-Beaver Campus in western Pennsylvania offered help in recruitment. Most of the workshop time, however, was spent in "hands-on" experience with the courseware. Two of the sessions were held on the University Park campus of The Pennsylvania State University. The third session was held at Philadelphia College of Textiles and Science. The sessions were well attended and highly valued by the teachers. Many of the teachers stated that use of computer courseware should always involve such sessions. Teacher response to the workshop program was very positive.

But something else important has happened. Participating parents are beginning to bring their friends to the program. Although most of the test sites now serve only one, two, or three parents, new parents have been identified who want to begin working with the courseware as soon as possible. A grassroots parent network seems to be forming to combat one of the continuing difficulties faced by many teachers -- that of recruiting parents who cannot read and are often fearful and embarrassed to admit this. It appears that recruitment will become less of a problem as the program becomes better known in the community.

The child data to be analyzed involve the pre/posttests given by the Chapter I teachers as part of their normal yearly evaluation of the program

as well as a survey of the child's attendance pattern. Although the pre/posttest data will not be available until autumn, we have begun to hear preliminary reports. A reading specialist from an elementary school in southeastern Pennsylvania noted that of all the students she served this year, the daughter of her adult student showed the greatest gain in reading scores from September to May. Such findings were echoed by a teacher in a junior high program in south-central Pennsylvania.

In addition, teachers have noticed significant attitudinal changes in the children whose parents are involved in the program. Angela (described at the beginning of this report) is only one example. A teacher in an elementary school in southeastern Pennsylvania told of a very shy little girl who:

> *...turned into a peacock. She strutted around the school telling everyone that her dad was coming to computer classes.*

As another example, a teacher in an elementary school in central Pennsylvania told of a young boy who:

> *...would never speak to anyone on the playground. He was especially afraid of the teachers and wouldn't even answer a direct question. Since he has been coming to my class with his mother in the evenings, he has changed so much at school. He runs to me on the playground and tells me all about his classroom. The other teachers have noticed the same thing. He's a different child!*

This project has attracted a great deal of attention both in Pennsylvania and nationally. The Institute staff was asked to report on it for the state meeting of Federal Program Directors, the regional Correctional Education Conference, the state and national conferences of the American Association for Adult and Continuing Education, and the conferences of the International Reading Association. A panel of the Chapter I teachers

involved in the project reported on parental use of the courseware to the first national conference on Adult Literacy and Technology. The program was highlighted on the Public Broadcasting System's Computer Chronicles. Dr. Eunice Askov, project director, was invited to testify concerning this project and other parent literacy initiatives for Congressman William Goodling's constituency. Karl Haigler, Head of the Adult Education Division in the U.S. Department of Education, has cited this project as one of three intergenerational projects in the U.S. and the only one with a solid research base.

As mentioned earlier, the intergenerational aspects of illiteracy have been discussed by many authors. Children whose parents do not read--or who have very marginal skills in reading--are handicapped in the educational process. They often pass on to their children not only a fear of the educational system but also an expectation of failure. Perhaps the most important result of such an intergenerational project is described best by one of the parents involved in the program:

> *I never read to my kid. I'm not quite ready yet. But, now, I think I'll try it real soon.*

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