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ABSTRACT

This paper describes a pilot program conducted in Baltimore County, Maryland, which involves using an Apple IIc computer with homebound students. The computer is used to initiate a unit or topic, to provide drill and practice, to review or reinforce a concept, and to motivate students. A sample home teaching lesson plan on the topic of measurement and fractions briefly illustrates the computer application in home tutoring. Results of a survey of Maryland educators of students who are homebound or hospitalized found that 15 of 20 educators use computers with their students, primarily for mathematics, science, and language arts. The survey examined problems in computer use and ideas for improving the use of computers. Examples are cited of positive outcomes of home computer usage with confined children. (JDD)

USING INSTRUCTIONAL TECHNOLOGY WITH HOMEBOUND STUDENTS

Filling the gap! Keeping them up! Creating school away from school! Hundreds of H & H teachers across the nation are responsible for educating students, K-12, who are confined to home, hospital or institutions due to illness, accident, disability, pregnancy, or emotional disturbance. Traditionally, this one-on-one tutoring has been accomplished with the child's own materials from school. Home teachers have used a classroom approach, such as a blackboard or other visual aids and manipulatives in order to motivate and focus the student. Materials appropriate to each child's educational curriculum as well as his/her current physical needs have always been a major concern of the home teacher.

In Fall 1987, an Apple IIC computer was piloted with homebound students from Baltimore County, Maryland. From that time on, a whole new dimension has evolved in the homebound teaching/learning program. Truly, "high tech" has come to the homebound student! But this is just the beginning. As Brita Meng says,

> "For most people, a computer makes things easier. For people with disabilities, it can make the impossible possible."

Using the Apple IIC computer, students often utilize MECC software as well as selected other commercial programs. Considering the subject, grade level, ability level and previous computer experience of each pupil, the teacher must decide how this electronic teaching tool best suits each child and his/her curriculum. Computer software disks can be used for a variety of purposes:

1) To initiate a unit or a topic.
2) To motivate students - the computer seems to lure children step by step to learn a skill, especially in math.

Sometimes a selected portion of a program is used to review or reinforce a concept, sequences or rule. The change of pace seems to provide the needed spark and attention-getter for most students. Programs are used for drill and practice rather than the traditional pencil and paper exercises. In this way, students get computer time while also reviewing skills or concepts. When appropriate, the software is used as a summary or evaluation of the lesson as opposed to traditional or routine methods. Pupils seem to like the challenge and surprise!

Another way to utilize the software with students is to interact with them as they are going through the program. For example, as they are reading the text, interject - "Why?" - or ask - "If you were writing this program, how else could you say this?"

When students appear to be unsure or confused, cover up the screen with your hand and say "Tell me what you're thinking!" The teaching/learning experience becomes more vital, more dynamic, and more fun than it already is!

Linda Royahn Copper
Baltimore County Schools
June 1991

Sharing a sample home teaching lesson plan will help to make the use of computers more realistic. Several disks are integrated throughout the entire lesson.

SAMPLE OF A HOME TEACHING LESSON PLAN

The integration of computers into the homebound instructional program is a unique feature. First and foremost, computer awareness and literacy skills are presented and are consistently practiced. In addition, software is utilized for a variety of teaching/learning purposes. In today's lesson, the computer will be used to implement several goals and objectives:

1. To make a transition from the home environment to a school orientation within the same surroundings.
2. To focus the pupil's attention on mathematics skills.
3. To allow the student to practice and demonstrate computer literacy skills.
4. To provide drill and practice of basic addition and subtraction facts within a timed format.
5. To reinforce linear measurement skills in units of centimeters by estiamting and measuring.
6. To incorporate reading skills within a mathematics lesson.
7. To extend and apply the concept of fractions as one evaluative measure of the pupil's comprehension and thinking skills.

The student's motivation and enthusiasm for the computer can not be overemphasized. In conjunction with a series of traditional methods and materials, the use of the computer has been invaluable.

In the beginning of the lesson, the student did drill problems on one of the disks rather than a written page of examples. A "hands-on" activity involving measurement and fractions followed. A reinforcement of visualizing fractional parts in a semi-abstract mode was accomplished by a portion of another disk. Near the end of the lesson, a selected portion of a disk provided an application of the concept as an evaluation/ summary.

This description illustrates how more than one objective can be accomplished through the use of a computer.

Home tutoring with the computer as a vital teaching tool presents a unique medley of positive outcomes:

(1) Each pupil is able to have more individual computer time than is usually possible in school.

(2) Students are able to see computer programs and applications across the curriculums, and solidly integrate learnings.

(3) In addition to a positive academic experience, the computer affords genuine therapeutic value to these isolated and confined students.

Other homebound programs in Maryland also incorporate the use of computers. One large county, Montgomery County, uses 4 Apple II C's and 4 IBM compatible laptops. Their emphasis is on writing and word processing in English classes. They use Appleworks with Business Courses.

Baltimore City has Apple computers in all hospital schools. Loaner computers are also offered. Many teachers have bought their own. Fran Bateson, the Principal of H & H in Baltimore City, sees most success with computers among the head injury patients. A Hospital Adolescent Unit has produced a small booklet of student work on computers which is on display.

Because several H & H teachers across the state use computers, a survey was taken to obtain input to various questions in order to determine some trend.

SURVEY QUESTIONS

1) Do you use a computer with your students?

Yes No

If "yes", please continue with questions below.
If "no", would you like to use a computer?
Please explain your response.

2) I use a computer with:

elementary middle school high school students.

(Circle all appropriate levels.)

3) Please indicate the subject(s) for which you use the computer:

English Math Science Social Studies

Spelling Language Arts Electives

(If electives, please list them.)

4) Please circle the purposes listed below that the computer serves in your instructional program:

Preparation of lessons
Motivation
Reinforcement
Instruction
Drill and Practice
Simulation
Evaluation
Parent Involvement
Enrichment
Increase Attention Span
Other: (please be specific)

Recordkeeping
Word Processing (student, teacher)
Behavior Mod
Data Base
Individualizing the Lesson
Collecting Data from Experiments
Independent Thinking
Increase Time on Task
Problem Solving

Please draw a circle around all of the types of disabilities/conditions of students using the computer with you.

Physical Disabilities	Emotional Disabilities
Head Injury	Chronically Ill
Pregnant Girls	
Other:	

Do you feel that a particular group of disabled children benefit more than others? Explain.

6) Are there any problems/drawbacks when using a computer with the homebound? Please explain briefly.

7) Do you have any ideas for improving the use of computers with home/hospital students?

8) What is your vision/hope for the future in terms of using technology with the homebound population?

The results of the survey have been compiled.

RESULTS OF HOME AND HOSPITAL SURVEY

1. Yes (15) No (5)

2. Elem. 6 MS 12 High School 13

3. English 5 Math 11 Science 8 Social Studies 5

Spelling 3 Lang. Art 5 Electives
Comp. Sci.
Health
Group Activities

4. Purposes:

Preparation of Lessons	4
Motivation	12
Reinforcement	8
Instruction	11
Drill and Practice	11
Simulation	3
Evaluation	5
Parent Involvement	1
Enrichment	8
Increase Attention Span	5
Recordkeeping	3
Word Processing	8
Behavior Mod	3
Data Base	5
Individualizing Lesson	7
Data from Experiments	2
Independent Thinking	5
Increase Thinking Skills	2
Increase Time on Task	6
Problem Solving	10

Other: The reteaching of cognitive skills of head injured students.

5. Types of Disabilities:

Physical Disabilities	9
Head Injury	4
Pregnant Girls	9
Emotional Disabilities	11
Chronically Ill	4
Suspensions	1
LD	2
Visual Impaired	1

Group Benefit More:
- Severe Head Injury
- EH (short attention span; extra motivation; low self-esteem; hyperactive)
- LD
- Several respondents said (ALL) students Attend better and longer to computer as compared with teacher instruction.

6. Problems/Drawbacks:
- Not enough computers
- Transporting (no carriers; heavy)
- Can't be left in homes
- Theft from car
- Roaches in equipment (poor home environments)
- Time factors (to set it up)
- Lack of a printer
- Software for higher math and science
- Teacher knowledge of each computer program

7. Improvements:
- Laptops
- Portable App. II
- MAC
- More math software
- Carrying cases
- Creative Writing

8. Vision/Hope:
- Laptops
- Computers in home (each child has one)
- CAI (Integrated Learning Program)
- Increase computer use into other subject areas
- Bulletin Board/Modem/Fax Hookups between students and teacher
- Video Discs (Laser Disc Players)

Hospital Programs -
- 5-6 computers so each student has immediate access to one

The evidence suggested here indicates the wide use, positive effect, and potential expansion of using computers with homebound students. A brief summary includes:

1) Computers are used at all levels - elementary, middle school, and high school.

2) All subjects are covered, including many electives.

3) Computers help to meet numerous educational purposes, especially for the emotionally disabled, the physically disadvantaged, and pregnant girls.

4) Although some drawbacks have been cited (and can be modified), the enthusiasm and determination of the teachers who use computers can be sensed via the suggestions for improvements and ideas for the future.

Overall, the use of computers with the Home/Hospital bound population is "alive and well." Because of mandates in the I.D.E.A. legislation, the objectives of NEA, and the standards of NCTM (among others), educators nationwide can expect the use of technology to grow - including the home/hospital bound programs.

"Model Learner Outcome For Information Technology Education" cites specific research findings:

1) Positive results were found with tutorials, and drill and practice applications as supplements to traditional classroom instruction. These were most effective with elementary school and low-achieving students as compared with average and high ability students.

2) Computer applications, particularly simulations in science and math have yielded higher effects than in any other areas.

3) Early results seem to suggest that applications such as hypermedia, desktop presenting, and interactive video seem even more useful in providing meaningful learning experiences than earlier uses of computers such as drill and practice.

Several of my own personal experiences suggest several positive effects with confined children. For example, a few years ago, I was assigned an 8th grade L.D. student who was having a difficult time with math. We used a software package on fractions, and I would leave the computer in his home over the weekend for additional time. His comment was, "At last I really understand fractions, and all I had to do was break my leg." Being a captive audience in a body cast, the student used the time and opportunity to focus on the skill, and he was successful.

This past fall, I had a first grade student who had not used the computer before. She began to work faster through the regular school requirements to allow enough time for "my buddy", the Apple IIC. She showed her excitement and enthusiasm by referring to the little reinforcers; "I have a new friend. Look how he jumps up and down when I get things right."

Four years ago, I taught a leukemic student for all of his first grade. He had had extensive chemotherapy. Because these children typically show deficits secondary to the "chemo", Johns Hopkins Hospital assesses each child periodically for educational evaluation. This child showed marked improvement, especially after using the computer twice a week for several months. We were notified that Antonio got a perfect 150 on the Otis-Lennon test and was placed in GT the next year. Certainly, not all credit can be given to the use of the computer, but it has clearly enhanced his home teaching experience.

There is one group of students which shows very noticeable changes in regard to the computer. This is the emotionally handicapped group. I have seen a very positive change (i.e. a turning point) with each child, especially the boys.

They acquire a higher interest level in attending the session as well as in the content. Their anxiety level decreases as they take control of an impersonal machine which guides them step by step at their own pace, giving frequent positive reinforcement. Their attendance at the sessions increases. They take on a confident identity. Time on task increases; they begin to complete assignments; and they are able to transfer learnings to pencil and paper tasks. Its a beautiful, rewarding experience to see such a transformation!

One emotionally disturbed girl had been expelled from a special school due to explosive outbursts and aggressive behavior. As you might expect, she had a short attention span; low self-esteem; and an extremely low frustration level. She seemed to get turned around when I showed her word processing on the computer. An instant success, Debbie "fell in love" - "This is fun and easy. I have to show my grandmother this. I'll bet I could learn this at the high school or community college and get a good job." Being relaxed and at ease, Debbie saw practical applications and even set a tentative goal on the spot. Small and insignificant? - I don't think so - for this girl, a new way of thinking - a new direction! And it seems to impact this population of homebound students much the same way, regardless of age.

Using the computer in the teaching/learning program has yielded benefits beyond the educational experience of the home-bound students. One major impact is on the parents. They see their children's reactions first hand and become very excited. As a result, they become supportive of all aspects with computers in education.

What are some immediate visions for the future?

1) To expand technology use in local home/hsopital school programs across the nation.

2) To encourage systematic documentation of teacher observations and student reactions in order to have greater evidences of the value of using computers with this population.

3) To develop video tapes of students and teachers using computer software in a teaching/learning session. A wide variety of students as well as subject areas could effectively show the enthusiasm and excitement of the students and teachers alike.

4) To provide an opportunity to pose the question to each home teaching supervisor and instructor: "What are you teaching now that you could teach more efficiently or effectively with the help of a computer?"

Since the advent of using the computer as a viable educational tool, interest has been sparked; more consistent attendance has occurred; and academic success has increased.

Have computer, will travel - you bet! My students and I get a lot of mileage from the Apple II C!

Reference: Model Learner Outcomes For Information Technology Education Minnesota Department of Education 1991.

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6	12	13

3.

English	Math	Science	Social Studies
5	11	8	5

Spelling	Lang. Art	Electives
3	6	Comp. Sci. Health Group Activities

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