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ABSTRACT

This paper discusses techniques for the preservice teacher to use in planning computer learning experiences for young children. Teachers need to become aware of the functions of the computer, the capabilities of computer technology with young children, and the response of young children to the computer in the learning environment. Teachers should be able to develop a plan for a computer center, and strive to promote computer awareness and computer literacy in children. They should also utilize the technology of computer assisted instruction (CAI) for drills and practice, tutorials, and simulations. The paper contains lists of computer terms, helpful hints on how to teach young children about computers, suggested computer activities for young children, and a list of 39 software programs designed for young children that cover the topics of language, numbers, classification, spatial relations, and creative projects. (MDM)

Computers and Young Children

Procedures and Practices in the Computer Laboratory

Early Childhood Education

Department of Curriculum and Instruction

School of Education

Baylor University

Waco, Texas

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Early Childhood Education

Preface

Early childhood educators continue to explore the role of computers in the learning environment for young children. Software continues to be developed to assist in various learning experiences. Young children live in a society of technology and technological change. They are curious and less inhibited than the adult in using the computer.

The first step in using the computer in a learning environment designed for young children is teacher preparation. The teacher needs to understand the use of a computer, how children respond to a computer, how to select appropriate software and plar for optimum learning. The following guidelines are designed to provide the preservice teacher with techniques in planning learning experiences for young children. The preservice teacher must plan time for hands on experience in the computer laboratory.

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Introduction

Computer technology is increasingly becoming a part of everyday life and the learning environment. Teachers need to become aware of the functions of the computer, the capabilities of the technology with young children and the response of young children to the computer in the learning environment. By using appropriate software the computer is a tool for application and problem solving.

This laboratory experience is designed to give the preservice teacher an opportunity to have hands on experiences with the computer in instruction and to develop techniques using the computer in a learning environment with young children. The main purpose of this experience for the children is to develop

computer awareness, computer literacy, keyboard knowledge and to enhance skills in following directions in developmentally appropriate learning experiences designed for the computer.

Computer Awareness

The young child should become aware of the computer and how it is a part of the environment. Emphasis should be placed on using the computer as a tool for application and problem solving.

How the computer can function, the many uses of computers and the appropriate care of the terminal and software should be the first step in using the computer with young children.

Computer Literacy

Learning the function of the computer and how to operate the computer is usually the first step. Developing and using a vocabulary of computer terms is the next step and can motivate the learner. These terms will assist in developing computer literacy.

Computer Terms

computer - A computer is a machine with a memory which accepts information, works on the information to solve a problem, and puts out the answer.

cursor - A cursor is a symbol on a computer screen. On some computers, a cursor is a lighted square which can be moved around to tell where the next letter or number will appear.

data - Data is the information that a computer needs to solve a problem.

disk - A disk is a shortened name for magnetic disk or floppy diskette.

disk drive - A disk drive is a machine which is used with large and small computers. A magnetic disk is placed in the disk drive. The computer can then save and use information on the magnetic disk.

diskette - A diskette is a small magnetic disk. It may be used with a microcomputer to store information. Diskette is a shortened name for floppy diskette or micro-floppy diskette.

flowchart- A flowchart is a drawing or map that tells the steps needed to solve a problem. It also shows the correct order for doing the steps. A computer program may be written form the flowchart.

graphics - Graphics are pictures, charts, and special letters drawn by a computer. Graphics might be in color and they may move. Computer graphics may be seen on a screen or printed on a printer.

hardware- Hardware is the computer machinery. A disk drive monitor is a piece of hardware.

information retrieval- Information retrieval means that the information that is stored in a computer can be gotten (retrieved)) from the computer's memory. Names and addresses may be stored in a computer's memory. A person may direct the computer to retrieve this information and print it on address labels.

input - Input is the information the user enters into the computer. A person may enter one's material into the computer by typing it on a keyboard.

input device- Changes the action of the operator (human) to an electronic signal the compute understands.

keyboard - A keyboard can be used to enter data into a computer. A keyboard has many keys with letters, numbers and symbols on them. many computer keyboards are similar to typewriter keyboards.

microcomputer - A microcomputer is a small computer. it usually has a keyboard like a typewriter and is often about the same size as a typewriter. Microcomputers are used today in homes and schools because they are small and cost less than larger computers.

output - The output from a computer is the design for one person data the computer sends out. It may be the answer to the problem or it may be the problem itself. The output may be seen on a monitor or printed on a printer.

printer - A printer is a machine that prints on paper the data (output) that comes from a computer.

program - A program is a set of instructions which tells the computer what to do. There are many different languages used to program computers.

programmer - A programmer is a person who writes a computer program. A programer uses a special language the computer understands.

software - Programs and data that go into the computer are known as software. A programmer writes software for a computer.

programming language - Language used to enter data.

mouse - An input device that changes movement into electronic signals the computer can understand.

Computer Techniques

The most used technique with the computer in an environment planned for young children is computer assisted instruction. This technique can be used in three ways: drill and practice, tutorial and simulation.

Drill and practice: This technique offers an opportunity to improve skills already learned. Software is available in language and mathematics for drill and practice.

Tutorial: This technique gives a sequence of information with an activity about the content.

Simulation: This technique describes a situation and the child must act on the situation.

Tutorial and simulation require more teacher direction. A computer drill and practice program can be integrated into a learning center after the child masters the keyboard.

Computer assisted instruction offers an opportunity for the young child to become familiar with hardware, keyboard,

terminology, software and enhance problem solving skills. The child receives feedback, follows directions, works independently and can share ideas with others.

The technique of using the computer as a tool with appropriate selected software for problem solving and application should be emphasized. This experience could involve collaborative learning.

Planning for the Computer Center

The purpose of this center is to develop computer awareness, computer literacy, keyboard skills, following directions and problem solving. Planning is an important step in developing the role of the computer in the learning environment of the young child.

Steps to Follow in Planning:

I. Computer Awareness

Introduce children to the computer. Find out what experiences they have had with a computer. Guide the children into the knowledge how a computer functions and the care of the computer.

II. Computer Literacy

Introduce termirology and keyboard experiences. Use terminology in the weekly experiences.

III. Select techniques to be used for the session.
Select software carefully. Be sure to preview software and know how to work with the program and activity before presenting it to the children.

IV. Write a teaching plan for the computer software. Outline for the Teaching Plan:

Software:

Concepts and Skills:

Directions:

Questions:

Follow up:

Helpful Hints

Develop a positive attitude about the computer. Remember this is a tool for learning.

Emphasize problem solving and application with appropriate software.

Know your computer.

Know the care of the computer and software.

Learn terminology.

Provide time for hands on experience before you work with a child.

Select the technique of instruction to use with computer experiences.

Select software with care and review software before using with children. Software must be compatible with the computer.

Every program is not for every child.

Identify your objective for each activity with the children.

Plan each learning experience with the computer.

Assess the level of the learner.

Check the handedness of the child. Remember to place the mouse in the correct position.

Consider directions to be given for the software.

Consider questions appropriate for the software.

Evaluate progress of each session.

Plan a risk free, developmentally appropriate environment.

Activities for the Computer Center

Make a survey of children's' experiences with the computer. Record this information on a chart or in a book.

Take a trip to a computer store and see the different computers and software. Write an experience story about the trip. Draw a mural of the trip and the computer store.

Take a trip to businesses, a computer science department or other places where computers are used.

Discover how computers help us each day. Have the child make a book about the many uses of the computer in their daily life.

Suggest children look for computers or information about computers in places other than the computer center. Invite them to share their findings.

Encourage children to look in magazines and newspapers and bring pictures of computers for bulletin boards or collage.

Make a poster about the care of a computer.

Read about computers in the encyclopedia. compare the early computer with the computer of today.

Introduce computer terms. Include computer, terminal, cursor, disk drive, diskette, input, output, keyboard, monitor, hardware, software.

Make keyboards from poster board for the children in identifying letters, numbers and other keys used in computer assisted instruction or programming.

Make card games of computer parts and terms for identification, matching and following directions.

Make a sorting game of computer parts and other electronic aids. Instruct the children to find the pictures that "go together."

Select computer assisted software for the children. Explain the procedure to work with the programs. Prepare a sequence chart of the steps to follow when using a program.

Allow children to work with partners or in small teams with computer assisted instructions.

Select software for children to use independently with drill and practice.

Make a scrap book for the library center identifying the many uses of the computer.

Make available computer catalogues in the art center for children to use in collage or to construct mobiles.

Arrange a demonstration with a printer.

Play a game with the children being the cursor and following directions. Example: Take two steps forward, turn right and take two steps.

Draw pictures of a computer and make a display.

Provide social experiences by providing a time for children to discuss their activities and their learning.

Select software for creative expression and story writing. Create pictures (Super Paint) and stories. Make into a booklet.

View story books on computer disks. Illustrate and develop extended activities.

Plan a brief unit with selected software as the theme. Extend the learning by integrating the disciplines.

Extend learning with songs, fingerplays, games, manipulatives, stories, creative art experiences, and cooking experiences.

Video tape the children and their responses. This can be a source evaluation with the children.

Selecting Software

Care should be taken in selecting software for young children. Pre-view each selection. Know objectives, skills, and concepts in each selection. Emphasis should be on problem solving and application in using appropriate selected software. Plan the learning experience. Include follow up and evaluation with each child. The following software is listed by Content, Concepts, and Skills.

LANGUAGE

Title	Concepts and Skills
Bank Sheet Writer III Scholastic Software	Word Processing
Early Elementary II Computations	Letter recognition, counting.
Getting Ready to Read and Add Sunburst Communications, Inc.	Numerals, U/L case letters.
Hodge Podge: Artworx	Letter recognition. (music with numerals)

Kids on Keys: Spinmaker Software Corp.	Creating Computer Storybooks.
Letter Recognition Hartley Courseware, Inc.	Locating Keys on the Board.
Muppet Word Book Sunburst Communications	Letters and words.
Paint With Words MEEC	Letter recognition.
Stickybear ABC Weekly Reader Software	Letter recognition.
Tink's Adventure Mindscape, Inc.	Key location, alphabetical order.

NUMBERS

Bumble Games: The Learning Company.	Plotting (x,y) points on grid.
Learning about numbers: C& C Software	Counting, clocks, basic math facts.
Math Rabbit: The Learning Center	Counting, matching sets, addition, subtraction.
Stickybear Math: Weekly Reader Software.	Counting, addition, and subtraction.
Delta Draw: Spinmaker Software Corporation.	Shapes.

CLASSIFICATION

Ernie's Magic Shapes: Hi Tech Expressions	Visual Discrimination Practice.
Patterns: MEEC	Pattern Recognition
Preschool IQ Builder: PDI Software.	Concepts of same and different.

SPATIAL RELATIONS

Delta Drawing: Spinmaker Software Corporation	Drawing programming concepts.
Juggle's Rainbow: The Learning Company	Spatial relations.
Stickybear Opposites: Weekly Reader Software	Opposites, e.g. "near/far."
Tonk in the Land of Buddy Bots: Mindscape, Inc.	Problem Solving.

CREATIVE PROJECTS

Dinosaurs are Forever: Polarware, Inc.	Coloring pictures.
Early Games: Springboard	Counting, letters, drawing.

Logo Power: Mindscape Inc.	Teaches twelve basic logo commands.
Microzine Jr. (Sept./Oct.): Scholastic Software Inc.	Habitats, making masks, programming.
Super Print: Scholastic Software	Printing utility.
Teddy Bearrels of fun: DLM	Creating pictures, graphics, and stories.
Super Paint:	Creating pictures and stories.
Kindercomp: Spinmaker Software Inc.	Matching upper and lower case letters; drawing.
McGee: Lawrence Publications and Productions.	Explore by using the computer.

Software for Young Children

The following information includes the program's title, the program's publisher, the program's copyright date, the recommended age range for users of the programs and a brief description of the content. Software listed is for the apple computer.

Bumble Games
The Learning Company
1982
yrs. 5 to 10
Five games from easy to difficult.
Practice plotting points on grid.

Bank Sheet Writer
Scholastic Software
1986
7 yrs. and up
Effective for writing experience stories.

Delta Draw
Spinmaker Software Corp.
1983
4 yrs. and up
Child moves cursor, or arrow keys to
fill in sections of a picture with
1 to 16 available colors.

Dinosaurs Are Forever
Polarware, Inc.
1988
3 and up
Allows child to gain experience with arrows or
mouse in drawing pictures.

Early Games
Springboard
1984
2 to 6 yrs.
Counting, letters and drawing.
A variety of activities are provided.

Ernies Magic Shapes
Hi Tech Expressions
1984
3 to 6 yrs.
Visual Discrimination Practice
(Color Monitor Required)

Getting Ready to Read and Add
Sunburst communications, Inc.
1984
3 to 6 yrs.
Apple
Numerals, U/L case letters.
Six activities based on the matching format.

Hodge Podge
Artworx
1982
1.5 to 6
Letter Recognition
(Easy to program).
Numerals may be used to write songs.

Juggle's Rainbow
The Learning Company
1982
3 to 6
Spatial relationships.

Kids on Keys
Spinnaker Software Corp.
1983
4 to 9
Letter recognition

Kid Writer
Spinnaker Software company
1986
3 to 6
Letters, numbers, clocks, upper/lower case .

Kindercomp
Spinnaker Software Company
1982
3 to 6
U/L case practice, drawing.

Learning About Numbers
C & C Software
1983
Apple
3 to 6
Counting, blocks, basic math facts.

Letter recognition
Hartley Courseware, Inc.
1983
5 to 7
Location of keys on keyboard.

Logo Power
Mindscape, Inc.
1986
7 to 10
Teaches twelve basic LOGO commands.
One disk teaches a series of 11 step by step tutorial
lessons and games designed to introduce 12 logo commands.

Math Rabbit
The Learning Company
1986
3 to 6
Counting, matching sets, addition, and subtraction.

Microzine Jr.
Scholastic Software, Inc.
1988
6 to 9
Habitats, making mask programming.

Muppet Word Book
Sunburst Communications
1986
3 to 6
Apple
Letter and Words
Six games on one disk providing practice with letters.
Upper and lower case matching.

Print Shop
Broderbund Software
1987
Creation of Printed Materials.
Allows creation of greeting cards, letterheads, or banners.
120 graphic elements.

Stickybear ABC
Weekly Reader Software
1982
3 to 6
Letter recognition with entertaining graphics.
Child presses any letter key to get one of two
pictures related to letter.

Stickybear Math
Weekly Reader Software
1984
6 to 9
Counting, addition, subtraction.
20 level math program that keeps
name, levels, score and types of problems for up to 25 children.

Stickybear Opposites
Weekly Reader Software
1986
3 to 6
Opposites
21 antonym pairs that are changed using arrow keys.

Paint With Words.
MEEC
1986
3 to 7
Letters and words using mouse.
The child created a scene by moving 1 of 8 words to a spot on the screen where it becomes a picture that is a part of the screen.

Patterns
MEEC
5 to 6
Apple
Shapes, sounds, and movements.
Three activities that give practice with staic sound or animated patterns.
Fourth activity for creation of pattern design.

Preschool IQ Builder I
PDI Software
1982
3 to 6
Concepts of same and different.
Contains seven lessons where the child presses the S or L key to indicate whether the pictures are the same or different.

Stickybear Reading
Weekly Reader Software
1985
5 and up
"Printing Fun for Everyone" allows creation of cards, posters, and stories.

Superprint
Scholastic Software
1987
5 and up
Printing Utility
Prints signs, cards, banners, or posters as large as 24 to 55 inches.

Teddy Bearreis of Fun
DLM
1986
5 and up
Creating pictures, graphics and stories.
Child uses space bar, return, and arrow keys to make scenes with teddybears. Includes over 200 pictures, backgrounds, and props that child can arrange on the screen.

Tink's Adventure
Mindscape Inc.
1984
4 to 8
Five games on one disk designed to give practice on key location and alphabetical order.

Tonk in the Land of Buddy Bots
Mindscape, Inc.
1984
4 to 8
Problem Solving
child uses mouse to move "Tonk" through a 65 screen landscape filled with robot parts, sky holes, and enemy soldiers.

McGee
Lawrence Productions
1989
2 to 6
Early Childhood, Special Ed.
Allows children to explore by using the computer.

Kids Time
Great Wave Software
1986
K to 3
Young children create a story, play a piano, and complete pictures or letters.

Ollie and Seymour
1987
Pre School
Very young children use arrow keys to practice shape and color recognition, counting to 10, and visual memory.

Explore a Story Series: Where Did My Toothbrush Go
William K. Bradford
1987 2 to 3
Enables students to read, enjoy a story, and change the story.

Curious George Visits the Library
DLM
1989
4 to 8
Computerized storybook with problem solving.

Curious George in Outer Space
DLM
1989
4 to 8
Computerized storybook.

Curious George Goes Shopping
DLM
1989
4 to 8
Computerized storybook.

Tale of Peter Rabbit
Beatrix Potter
DISCIS
1990
5 and older
Computerized storybook to enhance reader appreciation. No keyboard skills are needed.
(Apple Macintosh)

Super Paint
Silicon Beach Software
1988
5 and older
Child can draw pictures, designs, shapes and write stories. Many capabilities for problem solving and application.
(Apple Macintosh)

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