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Microcomputer Software for Kindergarten and Early Childhood Education

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MICROCOMPUTER SOFTWARE FOR KINDERGARTEN AND EARLY CHILDHOOD EDUCATION

by

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Abstract

Effective microcomputer software resources for early childhood education are available, but the information needed to locate them and put them to work is not readily accessible to the majority of early childhood teachers. This study identifies and evaluates sources of information on microcomputer software and provides a partial listing of appropriate software which is available, along with partial listings of courseware publishers and publications carrying information on microcomputer software. Criteria for self-evaluation of courseware are suggested and recommendations are made for insuring accessibility of resources to teachers within a school system.

CHAPTER ONE

Introduction

Statement of the Problem

Using existing software, how can microcomputers be used effectively in kindergarten and early childhood education?

Rationale

As society becomes more and more geared toward technology in everyday life, there is a need for children to become familiar with this technology and how it works. Microcomputers are a part of this technology and are used throughout industry and the professions. According to standards currently being developed by the Florida Department of Education (1985), by 1987 Florida children will be required to have some working knowledge about microcomputers by the third grade and develop a considerable degree of proficiency in the use of the microcomputer by the completion of the eighth grade. This means that microcomputers will need to be taught to children as early as kindergarten.

Young children can be taught how to operate a microcomputer and to develop the skills needed for programming. Ziajka (1983) states that even pre-school children can learn to operate a microcomputer, concurrently refining their fine motor skills and

eye-hand coordination. Software has been developed specifically to be used by early childhood students, both to improve eye-hand coordination and to reinforce basic skills and the use of imagination.

Bitter (1984) emphasizes that software which is carefully chosen can make the classroom microcomputer an extremely versatile tool both for the students and the teacher. Tipps and Sanders (1982) give a practical approach for considering the use of microcomputers with young children in the classroom and what teaching personnel working with young children need to look out for. Many pieces of software now exist for use with the young learner to enhance their abilities to learn and to reinforce skills for future use. The careful choosing of microcomputer software specifically suitable for kindergarten and early childhood is of the utmost importance for the effective use of microcomputers with this age child.

Purpose

The purpose of this study is to develop a partial listing of software programs available for use in various subject matter areas for grades K-2 and to provide suggested criteria for evaluating programs for classroom use.

CHAPTER TWO

Review of Literature

Reviews of software for early childhood education are not easily found. This is a fairly new area in computer programming. Publishers of educational software are really only beginning to publish software programs for this age student.

Because software for students in kindergarten through second grade is so new, McLanahan (1984) says that early childhood educators should begin to take an active role in learning about microcomputer software, what is available for this group of students, and whether the existing programs are suitable for the purposes the teacher intends.

Definitions

In order to have a better understanding of terms when looking at software for students in K-2, a teacher or educator needs to become familiar with the following definitions:

Courseware: Computer programs, complete with teacher materials, workbooks and guides.

Documentation or Support booklet: Written materials for the teacher to use with the microcomputer program.

Drill and practice or Rote drill: A type of microcomputer program which acts as a drillmaster by

providing repetitive practice on some basic skill or set of facts.

Educational game: A type of computer program with an instructional purpose presented in a game format.

Simulation: A type of computer program which recreates a real-world environment for examination.

Tutorial: A type of computer program which provides new information as well as repetitive drill and practice in the teaching of a basic skill or set of facts.

These definitions are from the Minnesota Educational Computing Consortium (1983).

Software: 1. The programs, languages, and/or routines used by a microcomputer to control its operations in a given function. 2. The disc or cassette tape on which a program is recorded. These terms are found in most reviews of courseware and are indicators to educators as to whether a program is suitable for a particular intended use in the classroom.

Sources of Software Reviews

Where are software reviews found? How can educators get access to these reviews?

Educational software reviews and previews are found in special review journals and reports, educational computing periodicals and newsletters,

education periodicals, and other sources. Brown, Grossman and Polson (1984) provide a fairly exhaustive listing of such sources. Truett (1984) also gives a listing of directories, review journals and other sources where educators can go to find reviews for educational software. Some sources list only software compatible with one brand of computer, e.g., The Book of Atari Software. Other sources list software for a variety of computers, e.g., the Educational Software Directory. Among educational periodicals and journals offering software reviews are Arithmetic Teacher, The Computing Teacher, Instructor, School Science and Mathematics, and School Library Journal. Addresses of these and other journals and magazines cited are listed in Appendix A. These only review several pieces of software per issue, so that one may have to look through several issues before finding a program suitable for early childhood. These sources give good reviews, but are poor sources for locating a number of programs at one time because of the time required in sifting through issue by issue.

Another source for reviews and previews of software are the catalogs published by software manufacturers and computer hardware companies such as IBM or Apple. Most of these sources just preview software. The program descriptions found in these catalogs are most likely to be the manufacturer's promotional sales

pitch for these programs, and not a critical review. An educator again would usually have to hunt for suitable software for early childhood under headings of math, language arts or educational games.

While there are many sources for reviews of educational software, some sources are better than others. Those sources which list lots of reviews and have them categorized under different subject areas and grade levels, with early childhood as a category, are certainly the most convenient to use. Brown, Grossman and Polson (1984) list several good review sources which follow along these lines. MicroSIFT Reviews and The Educational Software Selector (TESS) are two such sources.

MicroSIFT Reviews is available through the Department of Education of the State of Florida to the school districts, and can be found in county school board offices. Published by the Northwest Regional Education Library of Portland, Oregon, these comprehensive, one page evaluations may be duplicated and distributed to individual schools and/or teachers. Most of the published reviews are done by teams of three or more reviewers representative of potential users of the courseware package. Published quarterly, some 100 programs are evaluated each year. A sample evaluation

of "Bumble Games", a program suited to early childhood use, is attached as Appendix B.

TESS is an annually published descriptive listing of over 5,000 available software items. The 1984 edition contains ten pages of programs for early learning/preschool, over 100 individual listings. The type, grade level, uses (school, home, main line, remedial, etc.), scope (single or multi-topic, duration of use), a brief description, configuration (hardware compatibility, disk or cassette, etc.), components of the courseware package, and availability (source and cost) are given for each listing. Reviews, when available, are listed by publication, date, and a three-level rating code of negative, neutral or positive. Of the 103 programs listed in the 1984 Early Learning/ Preschool section, 23 listed reviews, 16 received one or more favorable reviews.

The Florida Center for Instructional Computing (FCIC) at the University of South Florida in Tampa is a good source of software reviews and will help educators find what they need for their purposes. According to Nall (1985), FCIC offers training programs and consulting services to schools for their help with all phases of instructional computing.

Educators can also contact the other State Univer-

sities for software reviews and can go there to preview software on hand. The problem is to find the time, energy and resources to go to the different software sources to preview software. As a practical matter, most teachers would prefer to have a source of reviews in their own school media center or a county consultant office for microcomputer software.

One practical solution to the preview problem is to order software from distributors and preview it in the classroom. Software is provided on a thirty day approval basis by some distributors with the understanding that there is a serious intent to buy the program if it proves suitable. These distributors provide free catalogs which offer courseware from many different publishers. According to Lathrop and Marshall (1985), distributors carefully screen the courseware listed in their catalogs and drop those programs which users find unacceptable. Florida Micro Media and Sunburst Communications are two such distributors. Their addresses are listed in Appendix C.

Lathrop (1984) also gives several suggestions about microcomputer disks which can be gotten through an organization known as Computer Using Educators (CUE). SOFTSWAP is a program for the exchange of public domain software by individuals or groups. Interested persons

may prepare and submit either a completed disk or instructional programs. Copies of SOFTSWAP disks or programs are available by:

1. Order disks by mail ($10.00 each).

2. Visit a microcomputer center and copy programs on your disks at no charge.

3. Copy programs from a friend who has them or from county school offices who have SOFTSWAP programs.

4. Send an original program as a contribution to SOFTSWAP on your own disk and a letter giving SOFTSWAP permission to distribute the program, and request any SOFTSWAP disk free in return.

CUE has a newsletter which lists all new disks in SOFTSWAP. To join, mail $8.00 to Don McKell, P.O. Box 18547, San Jose, CA 95158.

As more and more courseware is developed by publishers, more and more sources of information will become available to educators. In looking through the Software Buyers Guide in the March/April 1985 edition of Electronic Education one finds that Educational Computing Network, Micro Learningware, Minnesota Educational Computing Corporation and Sunburst Communications have software programs for most categories from administration through word processing. These programs are available for a number of brands of

hardware. Radio Shack Education Division is also listed with a broad range of software, but is limited to Radio Shack hardware.

Courseware Listing

The partial listing of early childhood courseware given below is intended to be just a sample of materials available in the two basic categories of math and language arts. Computer games may be involved in either category. This listing includes only programs which have received favorable review ratings. Addresses of courseware publishers are found in Appendix C.

Math Programs

1. Name: Introduction to Counting
   Publisher: Edu-Ware Services
   Mode/Hardware: Disk/Apple
   Description: Eight learning units expose students to block counting, addition and subtraction.
2. Name: Knowing Numbers
   Publisher: Learning Well
   Mode/Hardware: Disk/Apple
   Description: Three disks focus on essential skills: 1) number recognition, 2) less than/more than, 3) adding and subtraction fun.

3. Name: Number Match
   Publisher: Bertamax
   Mode/Hardware: Disk or cassette/Apple, Atari, TRS 80, TRS-C, Commodore 64
   Description: Developing the concept of numbers.
4. Name: Xerox Stickybear Numbers
   Publisher: Xerox/Optimum Resources
   Mode/Hardware: Disk/Apple, Atari
   Description: Students develop number recognition and build counting skills while playing with big, moving, animated objects.
5. Name: Counters
   Publisher: Sunburst Communications
   Mode/Hardware: Disk/Apple
   Description: Teaches counting and the basics of addition and subtraction.
6. Name: Kinder Concepts - Math
   Publisher: Midwest Software
   Mode/Hardware: Disk/Apple
   Description: Three disks, moving from basics of computer literacy through number recognition, counting, sequencing, more or less, longest and shortest, distance, basic addition and subtraction.

7. Name: Beginning Mathematics
   Publisher: Society for Visual Education
   Mode/Hardware: Disk/Apple
   Description: Drill, practice and tutorials in numbers, addition, subtraction, multiplication and division. After two incorrect answers, students are branched to remedial exercises.
8. Name: Counting Parade
   Publisher: Spinnaker
   Mode/Hardware: Disk/Apple, Commodore 64
   Description: Students match numbers by putting bears near palm trees with same number as given number. Dancing toucan gives approval or disapproval.
9. Name: Kindercomp
   Publisher: Spinnaker
   Mode/Hardware: Disk or cassette/Apple, Atari, Commodore 64, IBM/PC
   Description: A collection of six learning games for reading, counting and spelling.
10. Name: Number Match
    Publisher: Bertamax
    Mode/Hardware: Disk/Apple, TRS 80, Atari
    Description: The concept of numbers. Designed for slow learners and remedial education.

Language Arts

1. Name: Kermit's Electronic Storymaker
   Publisher: Simon & Schuster
   Mode/Hardware: Disk/Apple, Commodore 64
   Description: Allows students K-2 to create their own animated stories using muppet characters.
2. Name: Stickybear ABC
   Publisher: Xerox
   Mode/Hardware: Disk/Apple, Commodore 64, Atari
   Description: Students press keys to become familiar with alphabet and microcomputer keyboard. Complete package has software, companion hardback book and alphabet poster.
3. Name: Alphabet Circus
   Publisher: Developmental Learning Materials
   Mode/Hardware: Disk/Apple
   Description: Alphabet mastery with use of circus bigtop graphics, songs and games. Provides for letter recognition and keyboard skills.
4. Name: Stickybear Opposites
   Publisher: Xerox
   Mode/Hardware: Disk/Apple
   Description: Students learn about opposites with animated pictures.

5. Name: Early Learning Friends
   Publisher: Spinnaker
   Mode/Hardware: Disk/Apple, Commodore
   Description: Three disks teach students to recognize shapes and colors.
6. Name: Kittens, Kids and a Frog
   Publisher: Hartley
   Mode/Hardware: Disk/Apple
   Description: Students read stories, identify details, predict outcomes and draw conclusions.
7. Name: Charlie Brown's ABC's
   Publisher: Random House Electronic
   Mode/Hardware: Disk/Apple, Commodore 64
   Description: Explores the alphabet with Charlie Brown and his friends. Program uses animated fun to introduce students to letters and words.
8. Name: Clowning Around
   Publisher: Learning Technologies
   Mode/Hardware: Disk/Apple
   Description: Problem solving program where students remember which objects appeared in which numbered boxes.

9. Name: Alphakey
   Publisher: Bertamax
   Mode/Hardware: Disk/Apple, TRS 80, TRS-C
   Description: Focuses on teaching the location of letter keys on the keyboard and typing letters in alphabetical order.
10. Name: Better View a Zoo
   Publisher: Sunburst Communications
   Mode/Hardware: Disk/TRS 80
   Description: Provides students with practice in letter identification, numbers and directions, and in reading stories.

Criteria for Reviews

Having spent some time looking over software reviews for early childhood, educators may want to get a program and review it for their own classroom use. Sanders and Sanders (1983) give suggestions as to what an educator needs to look for when reviewing software. When requesting software for review Sanders and Sanders (1983) point out that one must tell the publisher or distributor of the software what type of hardware the school has. Programs written for the Apple will not run on Radio Shack or vice versa, etc.. Also specify the memory capacity and whether the input drive is disk or cassette so the distributor can send the program in

the correct format.

In reviewing a program, the educator needs to keep in mind the following criteria as put together by this author from Burt (1985), Levy County School Board (1982) and Stewart (1985).

1. Is it educationally well designed and free from technical errors?

2. Does it provide immediate feedback for the student's response?

3. Does it provide adequate instructions for both teacher and student use?

4. Is the reading level appropriate for the intended user?

5. Does it provide simple proceedures for entering answers?

6. Can the pacing of material be controlled by the user?

7. Does it provide a way to correct mistakes?

8. Is the program consistent? Example: Keystroke request should remain constant throughout the program, such as "hit enter to continue".

9. Is it child proof? Does the program make allowances for such things as a student punching the key twice?

10. Does the program use the capabilities of the computer?

11. Is the program flexible, offering different levels of difficulty?

12. Does the program hold the student's attention?

13. Does the program provide positive reinforcement as well as help the student understand a wrong answer?

14. Does the program have diagnostic and branching features? (Branching in software is acting like a teacher, providing the bright student with advanced work and the slower student with remedial work.)

15. Does the program provide for teacher modification?

By keeping a check list on hand, the educator can review a microcomputer program and come up with a pretty good evaluation for the specific purpose for which the program is intended to be used. Most evaluation forms are easy to use with a simple code for answering the pertinent questions. A sample form from MicroSIFT is included as Appendix D.

Educators may use evaluation forms such as those from MicroSIFT or make up one for their own needs and criteria. Either way, as noted by Sanders and Sanders (1983), reviewing microcomputer software before

purchase is a must. Only by experiencing a program first hand can the educator know whether it meets his or her specific needs. Educators are the ones who must ensure that only high quality programs are used in the classroom.

CHAPTER THREE

Conclusions and Recommendations

The purpose of this study is to provide a partial listing of software programs available for use in various subject matter areas for grades K-2 and to provide suggested criteria for evaluating programs for classroom use.

Conclusions

Though microcomputer software programming for early childhood education is a relatively recent development, an ever expanding number of programs are being offered to educators. Appropriate use of these programs in the classroom requires that they be reviewed to determine their suitability for the specific classroom application intended.

Reviewing microcomputer software can be a long and tiring job for most educators. Not many would either desire or have the time to spend looking through volumes of journals, catalogs and other sources of software reviews for those which might be suitable for their purposes. What is needed by most educators is a quick and simple way to find suitable software. Providing such a resource would seem to be an appropriate responsibility for either the school district office or individual school media centers.

Recommendations

To provide educators with a current listing of available educational microcomputer software the school or school district would need to invest annually in a copy of The Educational Software Selector (TESS), which could be circulated to classroom teachers. Teachers could then scan the appropriate sections of TESS and indicate those programs which would appear to have application for them. Reviews, where available, could then be secured by the school media center or school district for further screening of programs before ordering and for circulation to appropriate teachers. Where reviews are not available, programs should be ordered on approval to allow first hand review before purchasing.

School districts should arrange to receive MicroSIFT Reviews from the State Department of Education, copy and distribute these to individual school media centers based on the appropriate grade levels.

A library of quality software programs can be maintained in each school media center for use by individual classroom teachers. An expandable list of programs available by subject matter (math, language arts, science, health, social studies, etc.) and grade levels should be kept current to allow teachers

to make maximum use of programs available. The list should provide the name of the program, mode and hardware used, and a brief description of the program.

Implementation of these recommendations may require additional personnel and/or additional training and support for existing personnel at school district and/or school media center levels.

Summary

Appropriate microcomputer software for early childhood education can be difficult to locate. There are numerous journals, periodicals and courseware publishers who have reviewed software for this age student. The problem is that educators have to sift through volumes of these in order to find suitable programs for the classroom.

To make it easier for educators to find microcomputer software for early childhood a comprehensive listing of available software needs to be made accessible for teachers to use in the classroom, reviews of potentially suitable programs obtained and circulated to classroom teachers, and a library of quality programs maintained in each school media center for teacher use.

Appendix A

Addresses of Publications Cited

1. Arithmetic Teacher

   NCTM

   1906 Association Dr.

   Reston, VA 22091

2. The Book of Atari Software

   The Book Company

   11223 S. Hindry Ave.

   Los Angeles, CA 90045

3. The Computing Teacher

   135 University of Oregon

   Eugene, OR 97403

4. CUE Newsletter

   Don McKell

   P.O. Box 18547

   San Jose, CA 95158

5. Educational Software Directory: A Subject Guide to Microcomputer Software

   Libraries Unlimited, Inc.

   P.O. Box 263

   Littleton, CO 80160

6. The Educational Software Selector (TESS)
   EPIE institute
   P.O. Box 839
   Water Mill, NY 11976
7. Instructor
   757 Third Ave.
   New York, NY 10017
8. MicroSIFT Reviews
   300 S.W. Sixth Ave.
   Portland, OR 97204
9. School Library Journal
   Bowker Company Magazine Division
   205 E. 42nd Street
   New York, NY 10017
10. School Science and Mathematics
    Bowling Green State University
    126 Life Science Building
    Bowling Green, OH 43403

Appendix B

Survey Instrument deleted, paper copy available upon request.

Appendix C

Addresses of Software Publishers and Distributors

1. Bertamax, Inc.
   3647 Stone Way North
   Seattle, WA 98103
2. Developmental Learning Materials
   One DLM Park
   Allen, TX 75002
3. Edu-Ware Services, Inc.
   A Division of Peachtree Software
   28035 Dorothy Drive
   Aqoura Hills, CA 91301
4. Florida Micro Media
   P.O. Box 10254
   Ft. Lauderdale, FL 33305
5. Hartley Courseware, Inc.
   123 Bridge
   Dimondale, MI 48821
6. Learning Technologies
   25041 MacKenzie
   Laguna Hills, CA 92653
7. Learning Well
   200 South Service Road
   Roslyn Heights, NY 11577

8. Midwest Software
   Box 214
   Farmington, MI 48024
9. Random House Electronic Publishing Division
   201 E. 50th Street
   New York, NY 10022
10. Simon & Schuster
    1230 Avenue of the Americas
    New York, NY 10020
11. Society for Visual Education
    1345 Diversey Parkway
    Chicago, IL 60614
12. Spinnaker Software Corporation
    One Kendall Square
    Cambridge, MA 02139
13. Sunburst Communication, Inc.
    39 Washington Avenue
    Pleasantville, NY 10570
14. Xerox Education Publishers
    245 Long Hill Road
    Middletown, CT 06457

Appendix D

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Survey Instrument deleted, paper copy available upon request.

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