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ABSTRACT

Suggestions are offered regarding the use and selection of software with LD (learning disabled) students. The scarcity of appropriate software for the population is pointed out and a hybrid selection scale based upon several existing scales is described. It is noted that the major reason for rejecting software is the high readability skill required of the user to follow directions. Results of reviews of software are summarized, and reviewers' requirements are noted, including educational soundness, flexibility, and adaptability to the peer teaching process. Appended are a list of software evaluation sources and/or directories, the sample evaluation scale, a list of software programs recommended for LD students in seven topic areas: microcomputer introduction; typing; quiz or lesson generators; word processing, cognitive, perceptual, spatial; language arts and reading; and mathematics, a list of software publishers. (CL)

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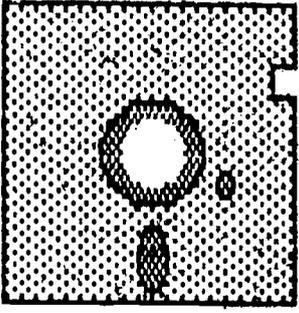
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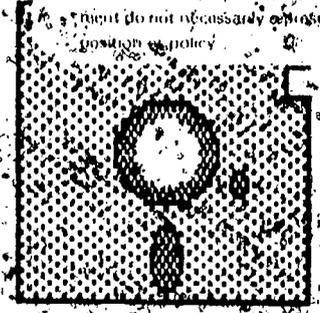
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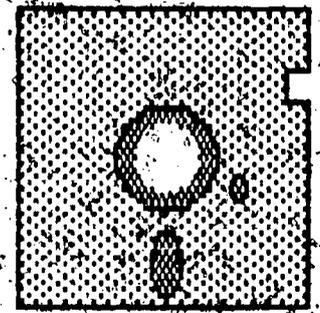
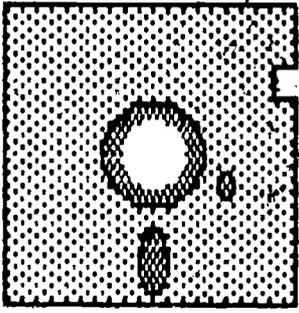
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# SOFTWARE PROGRAMS



# AND THE LEARNING DISABLED STUDENT



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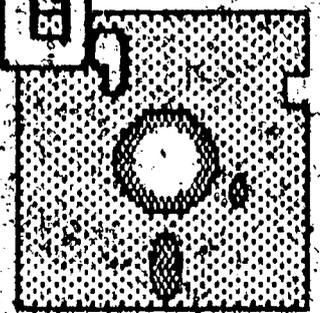
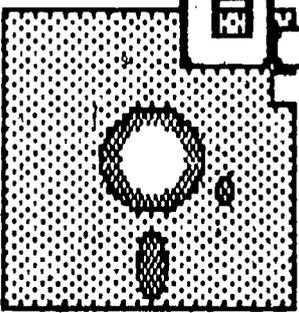
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B. A. OSTERAG,

ED.D.



*February 1985*

SOFTWARE PROGRAMS  
AND THE LEARNING DISABLED  
STUDENT

It is with increasing frustration that many professionals seek out computer-assisted instructional software for learning disabled individuals. The majority of existing educational software simply does not meet the specific needs of this population. Even among those programs touted as designed for remedial purposes, several problems exist. Many are boring, unimaginative, provide directions in reading levels too difficult for the intended user, are immature, and/or are educationally unsound. Methodologies that are employed in special curriculum materials for LD students have not yet found their way into most software programs.

This is not to say that even at its present level of development microcomputers cannot fill an important role in the education of students with learning problems. Its greatest contributions to special learners may defy statistics. Indeed, the most solid gains from computer use may be quite intangible (Uslan, 1983). There are several unique advantages afforded by microcomputers for this population. Some of these advantages include immediate reinforcement of student responses, individual pacing, non-emotional input during needed repetitions, undivided attention during input, nonjudgmental responses, and intrinsic motivation. When right, microcomputer software can provide excellent drill and practice, simulations and problem solving programs.

These strengths make the microcomputer a compelling teaching device and one that warrants continued development of appropriate software for our LD population. Unfortunately, major software-producing companies are not attracted to creating programs for just this population as the monetary rewards for generating such software are not as great as in other areas (ie: general entertainment games). The very nature of learning disabilities, the myriad forms in which these conditions may exist, also hampers software development in this area. On the positive side, the Department of Education has given five million dollars of federal funds to contractors to adopt and write courseware for the general special education population (Roberts, 1983). Despite the increase in government aid for the development of appropriate software, it is unrealistic to expect a great flood of programs for the L.D. population to appear in the very near future. This trend implies that those teachers who now want to begin using computer-assisted instructional software for persons with learning disabilities will have to turn to existing programs, whether or not this software has been specifically designed for the LD population.

In order to select the most appropriate software programs, a system should be used for evaluating and selecting microcomputer courseware. There are several sources (Table A) that offer courseware reviews and/or identify available software (Roberts, 1983; Hoffman, 1983; Uslan, 1983). After selecting those programs that appear to meet the general needs of your LD population, it is crucial to apply a formal evaluation tool.

An evaluation screening tool that has proved useful in this capacity is a hybrid scale developed by the author and based upon several existing software evaluation scales (see Table B). This quick evaluation tool has been successfully utilized by teachers on the campus in graduate-level courses and in their own special classes. As with any screening device, the benefits of its brevity also tend to negate some positive factors a more lengthy evaluation process might develop.

The majority of the software evaluated was originally designed for general education; scores have fallen in the low 70's and many programs have not wholeheartedly been recommended. Only some teacher utilities and word processing systems received very favorable reviews. The major problem with most rejected software centered on the high readability skills required of the user to follow directions. This was true even on supposedly remedial-skill programs. The reviewer consensus was that a reading-level of high-third or better was necessary for a user to function independently with current software programs. A heterogeneous peer-teaming, aide or teacher supervision was deemed necessary to allow low reading-level students to appropriately utilize the majority of this software.

There was a great deal of commonality between reviewers as to some features they demanded from computer assisted instructional software. First, the reviewers looked for the educational soundness of the material. Next, they wanted user-friendliness; this included ease of use for the novice computer user and clear, readable (5th reading level or less) directions. Reviewers

also preferred software to be flexible; because of the expense of most commercial software (public domain software was excluded from teacher review), teachers wanted versatile software that could be used more than once with a pupil, would allow teacher-input of problems, spelling words, etc., and could be used over a variety of subjects. Lastly, reviewers wanted software programs, after students had mastered their content, to be adaptable for student-input of problems, materials, etc.; the concept of using software as part of the peer-teaching process was strongly endorsed.

Software that was found to be generally useful with LD students are listed by recommended category (Table C). It is important to note that evaluator-subjectivity varied based upon the needs and abilities of their own students or situation. Teacher utilities and word processing systems received the best overall teacher evaluations. Next, the evaluators rated mathematical programs as being more successful with their LD students than the currently available reading or language arts programs. The top five rated programs, in descending order were: 1. Magic Slate (word processing); 2. Crossword Magic (teacher utility); 3. Academic Drill Builders (math and reading); 4. The Print Shop (cognitive spatial/teacher utility), and 5. BLOCKS (teacher utility). All programs were reviewed on an Apple II+ or IIe and are not inclusive of all available software in the education field.

Teachers of the LD are unlikely to meet all of their student's micro-computer needs through currently available software; they are going to have to become involved in the development of appropriate software. Unfortunately, software programming is exceedingly time-consuming and difficult. Most special educators do not have the programming expertise necessary to create even the simplest of programs. However, alternatives do exist. First, teachers must identify exactly what software needs exist for their particular situation. Next, they must objectify those needs. Third, special educators must prioritize on the basis of importance, over-all class utility and longevity of those needs. Teachers must then be able to identify community resources which are capable of developing software programs. Excellent sources are institutes of higher education (computer science majors are always looking for program ideas) and local computer-user groups. Educational software-developing companies continually seek ideas. Another important contact would be your State Department of Education; they should be able to serve as a resource network for personnel involved in microcomputer centers, projects or grants. The fifth step is to sit down with the identified programmer and explain exactly what you need. Sixth, determine what type of program (simulation, drill and practice, etc.) will be developed. Lastly, maintain constant communication with the programmer to assure that proper educational methodologies, goals, reading levels, objectives, multi-modality approach, etc. are being fulfilled. The end result should be a useful software program appropriate for LD students.

For those who wish to begin "yesterday" in providing appropriate micro-computer-aided lessons to learning disabled students, the recommended list of software should provide a base. Be aware that federal, state and private concerns are encouraging and funding software development for the handicapped; new material will become available over the next several years. Check educational periodicals, directories, magazines, etc. to keep abreast of these new software programs. Remember that microcomputer software is like any other educational tool: the selection and application must fit the needs of the individual learner. Choose that software which is flexible and able to be adapted to meet those needs posed by your particular students.

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and Sources

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Hoffman, R. Microcomputers and teachers. Denver: Love Publishing, 1979.

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Microsoft. Evaluator's guide for microcomputer-based instructional packages. Eugene, OR: University of Oregon, 1982.

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Moursund, D. (Ed.). The computing teacher. Eugene, OR: International Council for Computers in Education, 1983.

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Roberts, J. (Ed.). How to find good software. Electronic learning, October 1982, Volume 2, Number 2, 40-44.

Roberts, J. (Ed.). The software line-up: what reviewers look for when evaluating software. Electronic learning. October 1982, Volume 2, Number 2, 45-48.

Roberts, J. (Ed.). Report sees use of micros in spec ed rising dramatically. Electronic learning, October 1983, Volume 3, Number 2, 18.

Sanders, R.L. and Sanders, M.E. Evaluating microcomputer software. CRLA, Summer, 1983, Volume 1, Number 1, 21-25.

Special Ware Directory, The. LINC Associates, Inc., Columbus, OH: 1983.

Sloane, E. Computer smorgasbord: FLDRS-South microcomputer evaluation form. A paper presented at the annual convention of the Council for Exceptional Children, Hartford, C.T., March, 1983.

Taber, F. Microcomputers in special education: Selection and decision making process. Reston, VA: CEC, 1983.

Uslan, D. The human element in computer use. The catalyst, January/February 1983, Volume 2, Number 1, 1.

Table A: Software Evaluation Sources and/or Directories

AEDS Bulletin Association of Educational Data Systems 1201 Sixteenth Street, N.W. Washington, D.C. 20036	Electronic Learning Scholastic Inc. P. O. Box 645 Lyndhurst, NJ 07071-9986
Apple Journal of Courseware Review Box 28426 San Jose, CA 95159	EPIE Micro-Courseware Pro/Files EPIE & Consumer's Union Box 620 Stony Brook, NY 11790
Atari Program Exchange Atari, Inc., P. O. Box 427 155 Moffett Park Dr. Sunnyvale, CA 94086	Educational Software Director, Apple II Edition Sterling Swift Publishing Co. 1600 Fortview Road Austin, TX 78704
Classroom Computer News Box 266 Cambridge, MA 92138	Electronic Education 1311 Executive Center Drive, Suite 220 Tallahassee, FL 32301
Commodore Software Encyclopedia Commodore Business Machines Software Group 681 Moore Rd. 300 Valley Forge Square King of Prussia, PA 19406	Microprocessor Software D.A.T.A. Book D.A.T.A. P. O. Box 26875 San Diego, CA 92126
Computers, Reading and Language Arts Box 13247 Oakland, CA 94661	Microsoft Reviews Northwest Regional Education Laboratories 300 S.W. Sixth Avenue Portland, OR 97204
The Computing Teacher Department of Computer Science University of Oregon Eugene, OR 97403	Popular Computing 70 Main Street Petersborough, NH 03458
Courseware Report Card 150 West Carob Street Compton, CA 90220	Radio Shack TRS-80 Applications Software Sourcebook Radio Shack Box 17400 Fort Worth, TX 76102
Directory of Microcomputer Software Detapro Research 1895 Underwood Boulevard Delran, NJ 08075	School Microware Dresden Associates P. O. Box 246 Dresden, ME 04342

Software and Services  
Sourcebook and Supplement  
Information Sources, Inc.  
1807 Glenview Road  
Glenview, IL 60025

Special Education Software  
Review  
c/o Drive One Publishers, Ltd.  
3807 N. Northwood Ave.  
Peoria, IL 61614

Special Net Edutech Bulletin Board  
National Association of State  
Directors of Special Education  
1201 - 16th Street, NW  
Washington, D.C. 20036

The Special Ware Directory  
LINC Associates, Inc.  
1875 Morse Road  
Columbus, OH 43229

Teaching and Computers  
c/o Scholastic, Inc.  
P.O. Box 645  
Lyndhurst, NJ 07071-9986

VanLove's 1983 Apple II/III  
Software Director, Vol., II  
Advanced Software  
Technology, Inc.  
7899 Mastin Drive  
Overland Park, KS 66204

Table B: Microcomputer Software Evaluation Scale for L. D. Students

Subject Area/Topic:	Date Evaluated:
Title:	Date Published:
INTENDED ABILITY LEVEL: K 1 2 3 4 5 6 7 8 9 10 11 12 Adult Other _____	
INTENDED INTEREST LEVEL: K 1 2 3 4 5 6 7 8 9 10 11 12 Adult Other _____	
SOFTWARE MEMORY: 8K 16K 32K 48K 64K Other _____	
HARDWARE NEEDED: Apple Atari Commodore IBM PET TI TRS Other _____	
TRANSFER MEDIUM: Tape 5 1/4"Disk 8"Disk Cartridge Other _____	
SUPPLEMENTAL REQUIREMENTS: Audio Color Graphics Joystick/Paddle Light Pen Printer *Other _____	
COST:	
PUBLISHER:	
REPRODUCTION PERMITTED: Yes No      BACK-UP AVAILABLE: Yes No	
TYPE OF PROGRAM: Authoring System    Data Management    Diagnosis/Assessment Drill and Practice    Educational Game    Game Problem Solving    Simulation    Tutorial    Other _____	
MENU DRIVEN: Yes No      WRITTEN MANUAL: Yes No	

KEY:							
Excellent	Very Good	Good	Fair	Poor	Not Applicable		
5	4	3	2	1	0		
CONTENT:	5	4	3	2	1	0	1. Content based on Stated Behavioral Terms
	5	4	3	2	1	0	2. Content Accurate and Consistent
	5	4	3	2	1	0	3. Content Presentation Clear and Logical
	5	4	3	2	1	0	4. Racial, Ethnic and Sexist Stereotypes Avoided

EDUCATIONAL QUALITY:

- |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|
| 5 | 4 | 3 | 2 | 1 | 0 | 5. Directions Clear                                 |
| 5 | 4 | 3 | 2 | 1 | 0 | 6. Text at Intended Conceptual Level                |
| 5 | 4 | 3 | 2 | 1 | 0 | 7. Text at Intended Reading Level                   |
| 5 | 4 | 3 | 2 | 1 | 0 | 8. Purpose of Material Defined                      |
| 5 | 4 | 3 | 2 | 1 | 0 | 9. Program Objectives Met                           |
| 5 | 4 | 3 | 2 | 1 | 0 | 10. Appropriate Feedback for Incorrect Responses    |
| 5 | 4 | 3 | 2 | 1 | 0 | 11. Functions at User's Pace                        |
| 5 | 4 | 3 | 2 | 1 | 0 | 12. Size of Print Clear and Well-Spaced             |
| 5 | 4 | 3 | 2 | 1 | 0 | 13. Multi-sensory Approach Used                     |
| 5 | 4 | 3 | 2 | 1 | 0 | 14. Material Relevant to User Needs                 |
| 5 | 4 | 3 | 2 | 1 | 0 | 15. Program Motivating                              |
| 5 | 4 | 3 | 2 | 1 | 0 | 16. Skills Taught Transferrable to Other Situations |

GENERAL QUALITY:

- |   |   |   |   |   |   |  |
|---|---|---|---|---|---|--|
| 5 | 4 | 3 | 2 | 1 | 0 | 17. Program Operation Uncomplicated                    |
| 5 | 4 | 3 | 2 | 1 | 0 | 18. Support Materials Effective and Comprehensive      |
| 5 | 4 | 3 | 2 | 1 | 0 | 19. Program Reliable in Operation                      |
| 5 | 4 | 3 | 2 | 1 | 0 | 20. Material Effective with Individual Learning Styles |

PROGRAM RATING TOTAL (Add items 1-20)

Score

- 90-100 = Excellent. Recommend Without Hesitation.
- 80-89 = Very Good. Worth Purchasing.
- 70-79 = Good. Consider Purchasing
- 60-69 = Fair. May Want to Wait for Something Better.
- 59 and below = Poor. Do Not Recommend Purchasing

PROGRAM EFFECTIVENESS

Recommended For LD Students Usage: Yes No

Reading Level Required: K 1 2 3 4 5 6 7 8 9 10 11 12 Adult

Estimated Interest Level: K 1 2 3 4 5 6 7 8 9 10 11 12 Adult

ADDITIONAL COMMENTS:

Table C: Software Programs Recommended for Use With the Learning Disabled

<u>PROGRAM</u>	<u>PUBLISHER</u>
I. Microcomputer Introduction	
1. <u>Apple Keyboard</u>	Apple Computer
2. <u>Apple Presents Apple</u>	Apple Computer
II. Typing	
3. <u>Mastertype</u>	Lightning Software
4. <u>Typing Strategy</u>	Behavioral Engineering
5. <u>Typing Tutor II</u>	Microsoft
III. Quiz or Lesson Generators	
6. <u>BLOCKS</u>	San Juan Unified Schools
7. <u>Crossword Magic</u>	L&S Software
8. <u>Game Show</u>	Computer Advanced Ideas
9. <u>Master Match</u>	Computer Advanced Ideas
10. <u>Mix and Match</u>	Apple Computer
11. <u>Tic Tac Show</u>	Computer Advanced Ideas
IV. Word Processing	
12. <u>Bank Street Speller</u>	Broderbund Software
13. <u>Bank Street Writer</u>	Broderbund Software
14. <u>Magic Slate</u>	Sunburst Communications
15. <u>Milliken Word Processor</u>	Milliken Publishing Company
V. Cognitive, Perceptual, Spatial	
16. <u>Apple LOGO</u>	Apple Computer
17. <u>Delta Drawing</u>	Spinnaker Software
18. <u>Early Games for Young Children</u>	Counterpoint Software, Inc.
19. <u>Facemaker</u>	Spinnaker Software
20. <u>Gertrude's Puzzles</u>	Learning Company
21. <u>Gertrude's Secrets</u>	Learning Company
22. <u>Getting Ready to Read</u>	Sunburst Communication
23. <u>Juggle's Rainbow</u>	Learning Company
24. <u>KinderComp</u>	Spinnaker Software
25. <u>Memory: The First Step in Problem Solving</u>	Sunburst Communication
26. <u>Moptown</u>	Learning Company
27. <u>Add One Out</u>	Sunburst Communication
28. <u>Print Shop</u>	Broderbund Software
VI. Mathematics	
29. <u>Arcademic Drill Builders in Math Series</u>	DLM/Teaching Resources
30. <u>Basic Living Skills Series</u>	Love Publishing
31. <u>Basic Skills in Math Series</u>	Learning Company
32. <u>Bumble Games</u>	Learning Company
33. <u>Bumble Plot</u>	Learning Company
34. <u>Calendar</u>	Hartley Courseware
35. <u>Challenge Math</u>	Sunburst, Inc.

36. <u>Clock</u>	Hartley Courseware
37. <u>Division Skills</u>	Milton Bradley Company
38. <u>Elementary Math</u>	MECC
39. <u>FastMath</u>	NTS Software
40. <u>Getting the Basics</u>	NTS Software
41. <u>Math for Everyday Living</u>	Educational Activities
42. <u>Mathematics</u>	MECC
43. <u>Math Maze</u>	Designware
44. <u>Survival Math</u>	Sunburst Communications
45. <u>Teasers by Tobbs</u>	Sunburst Communications
46. <u>Telling Time</u>	Hartley Courseware
VII. Language Arts and Reading	
47. <u>Academic Drill Builders in Language Arts</u>	DLM
48. <u>Dragon Games</u>	Educational Activities
49. <u>Dragon's Keep</u>	Sunnyside Soft
50. <u>Early Words</u>	Merry Bee Communications
51. <u>Elementary #7</u>	MECC
52. <u>Sentences</u>	Micro Power and Light
53. <u>Spellicopter</u>	Designware
54. <u>Spellcaster</u>	NTS Software
55. <u>Spelltronics Series</u>	Educational Activities
56. <u>Sticky Bear ABC Series</u>	Xerox
57. <u>Word Families</u>	Hartley Courseware
58. <u>WordFlash</u>	Ideatech
59. <u>WordMaster</u>	NTS Software

Table D: Software Publishers

Apple Computer Company, Inc.  
20525 Marianna Avenue  
Cupertino, CA 95014

Behavioral Engineering  
230 Mount Herman Road  
Suite 207  
Scotts Valley, CA 95066

Broderbund Software  
1938 Fourth Street  
San Rafael, CA 94901

Computer Assisted Ideas  
1442A Walnut Street  
Suite 341  
Berkeley, CA 94709

Counterpoint Software, Inc.  
4005 W. 65th Street  
Minneapolis, CA 55435

Designware, Inc.  
185 Berry Street  
San Francisco, CA 94107

DLM Teaching Resources, Inc.  
One DLM Park  
Allen, TX 75002

Educational Activities, Inc.  
P.O. Box 392  
Freeport, NY 11520

Hartley Courseware, Inc.  
Box 431  
Dimondale, MI 48821

Ideatech Company  
P.O. Box 62451  
Sunnyvale, CA 94088

L&S Computerware  
1589 Fraser Drive  
Sunnyvale CA 94087

Learning Software  
4370 Alpine Road  
Portola Valley, CA 94025

Lightning Software  
P.O. Box 11725  
Palo Alto, CA 90436

Love Publishing Company  
1777 South Bellaire Street  
Denver, CO 80022

Merry Bee Communications  
815 Crest Drive-Papillion  
Omaha, NE 68046

Microsoft Corporation  
10700 Northrup Way  
Bellevue, WA 98004

Milliken Publishing Company  
1100 Research Boulevard  
Box 21579  
St. Louis, MO 63132-0579

Milton Bradley  
443 Shaker Road  
East Longmeadow, MA 01028

Minnesota Educational  
Computer Consortium  
2520 Broadway Drive  
Highway 280 & Broadway  
Saint Paul, MN 55113

MUSE  
347 North Charles Street  
Baltimore MD 21201

NTS Software  
680 North Arrowhead Avenue  
Rialto, CA 92376

San Juan Unified School  
District  
3738 Walnut Avenue  
Carmichael, CA 95608

Spinnaker  
215 First Street  
Cambridge, MA 02142

Sunburst Communications  
P.O. Box 40  
Pleasantville, NY 10570

Sunnyside Soft  
5815 East Parkway  
Fresno, CA 93727

Xerox  
Computer Software Division  
246 Longhill Road  
Middletown, CT 06457