DOCUMENT RESUME

ED 295 675 IR 013 387

AUTHOR McLaughlin, Pamela
TITLE Computer-Based Education. The Best of ERIC, 1986.
INSTITUTION ERIC Clearinghouse on Information Resources, Syracuse, N.Y.
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.
REPORT NO ISBN-0-937597-13-9
PUB DATE 87
CONTRACT 400-85-0001
NOTE 94p.; For the 1983-1985 edition, see ED 284 542.
AVAILABLE FROM Information Resources Publications, 030 Huntington Hall, Syracuse University, Syracuse, NY 13244-2340 (IR-72, $10.00 plus $1.50 shipping and handling).
PUB TYPE Information Analyses - ERIC Information Analysis Products (071) -- Reference Materials - Bibliographies (131)

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS Adult Basic Education; Annotated Bibliographies; *Computer Assisted Instruction; Computer Assisted Testing; *Computer Literacy; *Computer Managed Instruction; Computers; Computer Simulation; *Computer Software; Correctional Education; Disabilities; Distance Education; Elementary Secondary Education; Futures (of Society); Inservice Teacher Education; Interactive Video; Media Research; *Microcomputers; Technological Advancement
IDENTIFIERS Courseware Evaluation

ABSTRACT

The sixth report and first annual update in a series of selected ERIC bibliographies on computer-based education begun in 1973, this report provides 213 citations and abstracts from the 346 relevant documents entered in the ERIC system in 1986. The emphasis in selection was on documents that focus broadly on the topic of computer-based education (CBI) and provide information to aid in the decision-making process. Because of the size of the database, documents pertaining specifically to CBI in universities and colleges have not been included. Materials appearing in this bibliography are presented under four broad headings: (1) Computer-Assisted Instruction, which includes overview documents, conference proceedings, and papers on developing computer-based instruction, including videodisc interactive courseware; (2) Special Applications, including computer literacy, copyright and computer software, computer equity, software evaluation, computer use in counseling and guidance, management applications, computer networking, computer testing, and trends in CBI; (3) Subject Applications, which covers basic skills, business education, English as a second language and foreign languages, language arts, LOGO, mathematics, reading, science, social studies, and vocational education; and (4) Special Populations, i.e., adult or distance education students and handicapped learners. An author index is provided, as well as information for ordering ERIC documents. (EW)

COMPUTER-BASED EDUCATION

The Best of ERIC, 1986

by
Pamela McLaughlin

ERIC

An Information Analysis Product
1987

COMPUTER-BASED EDUCATION
The Best of ERIC 1986

by

Pamela McLaughlin

December 1987

ERIC Clearinghouse on Information Resources
Syracuse University
Syracuse, New York

Pamela McLaughlin is the User Services Coordinator of the ERIC Clearinghouse on Information Resources and an Adjunct Instructor in the School of Information Studies at Syracuse University.

Prior publications from ERIC/IR on this topic are:

Computer-Based Education: The Best of ERIC 1985, Pamela McLaughlin (ED 284 542). December 1986.

Computer-Based Education: The Best of ERIC June 1976-1982. Revised and Updated, by Keith A. Hall (ED 232 615). December 1982.

Computer-Based Education: The Best of ERIC June 1976-August 1980, by Keith A. Hall (ED 195 288). 1980. (Incorporated in 1982 edition).

Computer-Assisted Instruction: The Best of ERIC 1973-May 1976, by Marian Beard (ED 125 608). August 1976.

The Best of ERIC: Recent Trends in Computer-Assisted Instruction, by Richard Clark (ED 076 025). 1973.

This is the first annual update in this series.

ISBN: 0-937597-13-9

This publication was prepared with funding from the Office of Educational Research and Improvement, U.S. Department of Education, under contract no. 400-85-0001. The opinions expressed in this report do not necessarily reflect the positions or policies of OERI or ED.

TABLE OF CONTENTS

Introduction
Computer Assisted Instruction 1
A. Overview Documents 3
B. Conference Proceedings 3
C. Developing Computer-Based Instruction 11

Special Applications 16
A. Computer Literacy 16
B. Copyright 24
C. Equity Issues 25
D. Evaluation 26
E. Guidance 30
F. Management/Planning 32
G. Networking 35
H. Research 36
I. Testing 43
J. Trends 45

Subject Applications 46
A. Basic Skills 46
B. Business Education 47
C. English as a Second Language (ESL) and Foreign Languages 49
D. Language Arts 51
E. LOGO 57
F. Mathematics 59
G. Reading 63
H. Science 65
I. Social Studies 70
J. Vocational Education 71

Special Populations 77
A. Adult or Distance Education 77
B. Handicapped Learners 79

Author Index 86

How to Order ERIC Documents 89

FOREWORD

This series on *Computer-Based Instruction: The Best of ERIC* continues to be one of the popular titles among the publications of the ERIC Clearinghouse on Information Resources. Since the first edition was published in 1973, there have been four updates. Each update represents a larger body of literature than the previous edition.

Since each new edition begins where the last one ended, the series provides an overview of some of the most notable publications in this rapidly emerging area. When the first edition was published the microcomputer was virtually unknown; now computers can be found in 95% of U.S. public schools. Each edition has attempted to follow the same criteria for selection of items even though the number of documents has grown rapidly. To compensate for the rapid growth, we have gone to more frequent editions rather than larger ones.

The literature about computer based instruction (CBI) goes well beyond the documents available through ERIC. There are many books which are not indexed in ERIC because their availability is announced through other sources. There are hundreds of articles appearing in both new and well established journals that discuss the many facets of CBI. The *Current Index to Journals in Education* (CIJE) should be used to identify such articles.

The CBI literature is changing from descriptive to analytical. Earlier literature often reported case studies of computer use in teaching. Current publications are more oriented toward the *study* of computer use in teaching and learning. Questions of quality, effectiveness, and changes of behavior are explored. More publications are evaluative in nature. The new emphases reflect an emerging maturity of computer utilization in educational settings.

Your comments regarding the utility of this volume and suggestions for its improvement are always welcome.

Donald P. Ely
Director, ERIC/IR

INTRODUCTION

This publication is the first annual update in the *Computer-Based Education: The Best of ERIC 1976-1982* series. Other volumes in the series, which have been published at irregular intervals, cover the years 1973-1985 (see the list on the back of the title page). Designed for use by professional educators who need to make decisions about microcomputer use in schools, the update provides an overview of the literature through 1986 on computer use in elementary and secondary education, adult basic education, and special education.

Higher Education Excluded. Applications of computer-based education in institutions of higher learning differ in many ways from applications in elementary and secondary schools. The level of software, availability of hardware, and other issues relating to management are sufficiently distinct to warrant a separate publication. The few exceptions in this update are conference proceedings, which may cover all levels from K-12 through higher education. For practical uses of microcomputers in postsecondary education, the journal *Collegiate Microcomputer* (Rose-Hulman Institute of Technology, Terre Haute, IN 47803) is one of several that contain many useful articles on specific applications.

Scope of the Bibliography

Substantive ERIC documents from the 1986 volume of *Resources in Education* (RIE) have been selected for inclusion in this listing; journal articles have not been included. Although ERIC is national in scope, this bibliography is not intended to be comprehensive. For each topic covered, selected ERIC document citations are listed. An author index for the volume is also provided.

Types of materials targeted for selection include:

- Handbooks;
- Literature reviews;
- Teacher's guides;
- Administrator's guides;
- Program descriptions;
- Bibliographies;
- Research reports;
- Conference proceedings; and
- Evaluative reports.

Due to the size of the literature base, emphasis has been placed on documents that focus broadly on the topic of computer-based education, and provide information to aid in the decision making process. To this end, short documents (less than 10 pages), opinion papers, and descriptions of individual programs have not been included.

Search Strategy

A computerized search of the ERIC database for the year 1986 was performed using the following major terms: Computer Assisted Instruction; Computer Managed Instruction; Computer Simulation; Computer Uses in Education; Computer Oriented Programs; and Computer Literacy. This search yielded 346 items, of which 213 were selcted for inclusion. Most of the documents included in this bibliography are representative of the above criteria.

Organization of the Bibliography

This bibliography is divided into four major sections. The first contains 31 reports and papers that provide an overview or general discussion of computer assisted instruction (CAI), including resources and guidelines for the implementation of computer programs in schools; proceedings of five conferences, which address various facets of CAI at different levels through individual papers; and four papers on the development of CAI, including the design of interactive videodisc courseware. Focusing on special applications of computer-based education, the second section contains 23 documents on computer literacy, including teacher and administrator guides; two papers on copyright and computer software; three papers on computer equity; 10 papers on evaluation, including both criteria for software evaluation and evaluations of software packages; five reports on computer uses in counseling and guidance,

including descriptions of career planning systems; eight documents on management applications, including information on planning computer programs and developing a computer curriculum; three reports on computer networking; 16 research reports; six documents on computer testing; and two papers discussing trends in computer-based instruction. The third section covers computer applications in various subjects, including four reports on teaching basic skills; four on business education; six on teaching English as a second language (ESL) and foreign languages; 15 on language arts; seven on the LOGO programming language; nine on mathematics; six on reading; 11 on science; five on social studies; and 12 on vocational education. The final section focuses on computer uses with two special populations, and includes seven reports on adult basic education and 18 on handicapped learners. An author index and information on ordering ERIC documents are provided.

Within each section, documents are listed alphabetically by personal author or editor. If there is no personal author or editor, documents are alphabetized by title.

There is some overlap between the sections in the subject matter covered—e.g., one research project which explored the use of LOGO to teach mathematics appears in the mathematics section, a report on using LOGO and turtle graphics is listed in the science section, and a report on using LOGO with handicapped children appears in that section. Another exception is the proceedings of the Research and Theory Division of the Association for Educational Communications and Technology, which is listed in the section on Research. Items have not been listed in more than one category, so users may want to check more than one section for information on a given topic.

COMPUTER ASSISTED INSTRUCTION

Overview Documents

ED263905
Meta-Analysis of Findings on Computer-Based Education with Precollege Students.
Bangert-Drowns, Robert L.
1985; 8p. Paper presented at the Annual Meeting of the American Educational Research Association (69th, Chicago, IL, March 31-April 4, 1985).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Information Analyses—General (070); Reports—Research (143); Speeches/Meeting Papers (150)
Target Audience: Researchers
Major Descriptors: *Computer Assisted Instruction; *Conventional Instruction; *Intermode Differences; *Meta Analysis; *Student Attitudes

A quantitative or meta-analytic review was conducted of studies comparing computer-based education (CBE) to conventional instruction in precollege classrooms. Seventy-four studies were included in the review; sources included earlier reviews by Hartley, Burns, and authors from the University of Michigan, and the ERIC and Comprehensive Dissertation Abstracts databases. Remaining studies were found through bibliographic references in the collected articles and reviews. It was found that the average effect of computer-based instruction was to increase student test performance from the 50th to the 63rd percentile. Effects were most consistently high for computer-assisted instruction (drill and practice, tutoring) followed by computer-managed instruction and computer-enriched instruction; effects were also higher in published than in unpublished studies. In addition, CBE positively influenced student attitudes toward the course content and the computer. A list of references completes the document. (Author/JB)

ED264935
Using Computers to Construct Knowledge and Enhance Teacher-Child Interactions.
Daugherty, Thomas; And Others
1985; 31p. Paper presented at the Annual Symposium of the Jean Piaget Society (15th, Philadelphia, PA, June 6-8, 1985).
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Opinion Papers (120); Speeches/Meeting Papers (150)
Major Descriptors: *Cognitive Processes; *Elementary School Students; *Elementary School Teachers; *Microcomputers; *Teaching Methods; *Teaching Skills

Although inappropriate computer experiences emphasizing things more than people are frequently introduced into elementary school classrooms by inadequately trained administrators and teachers, computers can be appropriately used to liberate or empower thinking abilities. Certainly, computers should be used for specific reasons, but "appropriate" should be understood as a metaphor for emerging "good" teaching methodologies and adaptation of class content. When teachers begin to learn to use new programs in their classrooms, they reveal themselves as learners. Thus, students have the opportunity to learn with a learning adult. When learning is the model for what adults do in the classroom, then the computer provides a richness of possibilities; in the student-technology-teacher relationship, a unique opportunity implicitly exists. Computers are not teacher-remedial, nor should they be intrusive. Computer use.should be internalized by the teacher and the classroom dynamics into an already-excellent pedagogy. In essence, appropriate computer use should be viewed as a methodological hybrid, seen as an important media only when and where it offers significant instructional experiences. Teachers should have the time, in-service experience, and the security within the school system to use the computer to create a milieu in which students become hypothesis-testers with critical thinking abilities, and not fixed reality constructions. Appended materials illustrate the use of the computer to facilitate thought and describe various appropriate uses. (RH)

ED263912
Computers in Instruction. Report of Task Force on Use of Computers in Instruction.
Deasy, Richard J.
Maryland State Dept. of Education, Baltimore.
1984; 26p. Document is printed in colored ink on colored paper. For related document, see ED 263 911.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Opinion Papers (120); Reports—Research (143)
Target Audience: Practitioners
Major Descriptors: *Computer Literacy; *Microcomputers; *State Surveys

The Maryland Task Force on the Use of Computers in Instruction conducted a statewide survey of the following

components of a successful computer education program: planning; curriculum development; staff development; computer use; instructional equity; selection, maintenance, and evaluation of hardware and courseware; and parent and community involvement. In response to the results of this survey, the Task Force developed 34 recommendations for improvements in the above areas; in addition it offered suggestions for: (1) state certification guidelines for computer science teachers; (2) increased collaboration with higher education in providing staff with inservice computer training; (3) staff visits to computer demonstration sites; and (4) the establishment of a communications networking process for teachers and administrative and supervisory staff. In order to provide leadership and direction for computer education programs in Maryland, the Task Force also developed a model framework for computer education based upon existing curricula for computer literacy and computer science. (JB)

ED264658
Schools and Technology: New and the Future.
Demmon-Berger, Debbie; Hill, T. Susan
National School Boards Association, Alexandria, VA. Educational Policies Service.
1985; 5p.
Updating School Board Policies; v16 n11 p1-3 Dec 1985.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Journal Articles (080); Guides—Non-classroom (055); Opinion Papers (120)
Target Audience: Policymakers; Administrators; Practitioners
Major Descriptors: *Computer Assisted Instruction; *Computer Science; *Educational Trends; *Futures of Society; *Purchasing; *Technological Advancement

School systems, by and large, are hesitating in integrating new technology into the educational process. The new technology includes computers, telecommunications, electronic blackboards, interactive video for simulations, editing devices, and the new optical storage disk, the CD/ROM. Many believe the new technology can help to address such concerns as diverse population needs, equity in education, uniformity in curiculum, the shortage of qualified teaching personnel, and the need for lifelong learning and retraining experiences. School boards involved in the purchase of new technology are advised to begin with a planning committee—involving teachers—for long-range planning and to formulate a district needs assessment. Policy statements need to be made concerning equipment purchasing, ownership, use, and maintenance. Since most school systems will not have the resources for immediate, full-scale computerization, priorities must be set. Planners can move from a generalized statement to more specific curriculum, hardware, software, and staff development needs. (MLF)

ED270097
A Model for the Development of Computer Instructional Specifications.
Gerlach, Vernon S.; Cooper, Mary E.
1985; 39p.
EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.
Document Type: Reports—Research (143)
Target Audience: Practitioners; Researchers
Major Descriptors: *Computer Assisted Instruction; *Instructional Development; *Models

The development of computer-based instruction will be greatly facilitated by the use of an effective and efficient design model. Five components of such a model are: (1) the objective; (2) the content; (3) the questions; (4) the boundaries; and (5) the entry skills. A good objective describes either something observable that learners do, the conditions under which they do it, and the standard of an acceptable performance; or an observable product that learners produce, the conditions under which they do it, and the standard of an acceptable performance; or an observable product that learners produce, the conditions under which they produce it, and the standards of an acceptable product. The content may take many forms—definition, description, generalization, principle, rules, and others. Learner processes will vary according to the content type, i.e., a rule-using task requires the learner to state the rule and then to apply it to a previously unencountered example of the class of problems for which the rule is intended. The questions enable the student to interact with the content and they test the student's mastery of the objective. Questions may be stated in interrogative (Which one is green?) or imperative form (Write the sum of three numbers), and three kinds of feedback can be provided: knowledge of results (KR), knowledge of correct results (KCR), or KCR with advancement to next problem or question. The boundaries define the area the objective covers; one part of that area is the domain (stimulus or display), the other is the range (answers to the questions). Entry behaviors are stated for two reasons: to ensure that nothing is omitted and that there are no overlaps between old knowledge and new instruction, and to weed out students who lack prerequisite skills. Examples are provided for each of the five model components. (JB)

ED263878
Computers in the Schools: How Will Educators Cope with the Revolution?
Gleason, Gerald T.; Reed, Timothy

1985; 9p. Paper presented at the Annual Meeting of the American Educational Research Association (69th, Chicago, IL, March 31-April 4, 1985).

EDRS Price—MF01/PC01 Plus Postage.

Document Type: Reports—Research (143); Speeches/Meeting Papers (150)

Target Audience: Researchers

Major Descriptors: *Adoption Ideas; *Microcomputers; *Organizational Change; *Use Studies

A study was implemented to conduct a long-range observation and analysis of the process by which computers are channeled into educational practice. Data collection involved a structured interview with knowledgeable representatives of 35 school districts in Wisconsin. Participating schools were selected randomly and stratified by size. Questions in the interview focused on the status of a district's computer activity to date, including: types of hardware and software available, inservice training activities, district policy statements, and roles of school boards and parent-citizen groups. Results indicate all districts but one utilized computers during 1982-83; the number of computers available ranged from one in a small district to 232 in a large district. When analyzed on a computer/student ratio, there was a range of 1/28 to 1/412, and a mean ratio of 1/156; Apple is the overwhelming choice of schools; and most computers were located either in classrooms (83%), the library (51%), or a computer laboratory (54%): virtually all districts reported multiple placement. Only 10 of 35 school boards had taken any official action concerning computers in their system; however, 80% of the districts had provided inservice training activities during 1982-83. Lack of funds was most often cited as a limitation to implementation efforts and few school districts had any hard data on student home access to computers. A summary, recommendations, and references complete the document. (JB)

ED266765

A Guide to Computers in Education: Instruction.

Connecticut State Board of Education, Hartford.

1985; 89p.

EDRS Price—MF01/PC04 Plus Postage.

Document Type: Guides—Non-classroom (055)

Target Audience: Practitioners

Major Descriptors: *Computer Assisted Instruction; *Computer Literacy; *Microcomputers; *State Curriculum Guides

This manual is designed to provide guidance for local school districts in planning for the use of computers in the classroom, both as a subject for study and as a tool for teaching and learning in other subjects. Topics covered include goals and objectives, defining strategies for implementation, evaluating equipment and programs, training staff, and establishing fiscal support. The first of nine chapters discusses the educational application of computers and provides information on computer use in Connecticut public schools including the number of computers available for instruction and the brand of computers used. Chapters 2 and 3 cover planning committees, needs assessment, and developing a philosophy, goals, and objectives. Some considerations that are unique to planning for computers are noted, and examples are provided. Issues involved in the development of a computer literacy curriculum are discussed in chapter 4, and several examples of curriculum scope and sequence are provided. Chapter 5 outlines the different ways in which computers can be employed to strengthen instruction in subject areas and reviews examples of such use. Chapter 6 considers how to implement both a computer literacy program and computer use in subject areas, and chapter 7 focuses on the resources needed. Chapter 8 outlines evaluation considerations, and chapter 9 examines the future of educational computing. Appendices provide sources for documents used in production of the manual, a sample needs assessment survey, an outline for an advanced placement computer science course, and endnotes for each chapter. (JB)

ED268668

Copyright Issues in Computer-Assisted Instruction.

Helm, Virginia M.

1985; 12p. In Jones, Thomas N., and Semler, Darel P., Eds., *School Law Update 1985*. National Organization on Legal Problems of Education, 1985 (ED 268 667).

EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.

Document Type: Legal/Legislative/Regulatory Materials (090); Opinion Papers (120)

Target Audience: Practitioners

Major Descriptors: *Computer Assisted Instruction; *Computer Networks; *Computer Software; *Copyrights; *Legal Responsibility; *Microcomputers

The 1980 Amendments (P.L. 95-517) to the updated Copyright Law of 1976 contain two major provisions pertaining to computers. First, only one copy of the master copy of a piece of software may be legally duplicated—the backup copy made by the owner for archival purposes. Second, the only other legal copy of the master copy owned by the user is that copy reproduced by inputting the software into the computer in order to utilize the program.

The amendment clearly prohibits the unauthorized duplication of copies of a computer program for distribution and use by other than the owner of the master copy. However, it does not directly address (1) using a single-loading master copy to boot up sequentially two or more microcomputers or (2) using a slightly modified master copy in a network of microcomputers. There are at least four other sources or tests for assessing the legality of these software uses: (1) the market effect test, (2) the intended use test, (3) the simultaneous/sequential users test, and (4) the fair use test. However, the otherwise harsh implications of copyright restrictions for the schools are mitigated by (1) licensing agreements that may provide financially beneficial options to schools, (2) technological advances making duplications of tangible copies increasingly difficult, (3) software producers designing programs specifically for use in networks, and (4) greater amounts of high quality/low cost software by nonprofit producers. Until these conditions become more prevalent, educators need to know and abide by the restrictions placed on the use of instructional software by the copyright law. (MLF)

ED272144
Some of the Critical Issues in Introducing Computer Technology into Schools.
Heuston, Dustin H.
WICAT, Inc., Orem, Utah.
1985: 42p.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Guides—Non-classroom (055)
Target Audience: Policymakers; Practitioners
Major Descriptors: *Educational Planning; *Instructional Innovation; *Microcomputers; *Program Implementation; *Purchasing

This paper discusses some of the significant issues that school districts, superintendents, principals, board members, and faculty will have to face in the acquisition and implementation of educational hardware and software. Strengths and weaknesses of various computer configurations are presented and it is suggested that the use of professional systems is probably the best choice for school districts if they wish computers to have a serious instructional impact. It is also suggested that if school districts are not careful in their planning, purchasing, and implementation strategies, there may be a backlash against computers before their real advantages and strengths are understood. It is pointed out that behind the choice of the hardware systems and vendors is a deeper issue that educators must understand, i.e., the advent of computer technology will allow for extraordinary contributions to the advancement of education since computers will help improve the educational delivery system. A large portion of the discussion focuses on the concept of delivery systems and examples from the experience of the WICAT Education Institute's research school—the Waterford School—illustrate the use of a professional system. Current research is also discussed, particularly research on testing, which will allow new kinds of contributions to be made to the learning and testing processes. The paper concludes with short discussions of several important issues regarding instructional computing that school districts should consider. (JB)

ED260468
Television's Lessons for Educational Computing.
Krull, Robert
1984; 24p. Paper presented at the Annual Meeting of the International Communication Association (35th, Honolulu, HI, May 23-27, 1985).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Speeches/Meeting Papers (150); Information Analyses—General (070)
Major Descriptors *Childrens Television; *Courseware; *Educational Television; *Programing Broadcast; *Television Research; *Television Viewing

Based on the conviction that research findings on effective design of educational television programs may have useful lessons for designers of educational computing software, this paper reviews research on children's educational television and discusses ways in which the findings can be applied. The paper divides the research findings into the following sections: (1) children's attention and comprehension, (2) the settings for viewing and computing, (3) trends during viewing/computing sessions, (4) visual design attributes, and (5) auditory design attributes. A five-page bibliography concludes the paper. (HOD)

ED270095
The Instrument of the Future: Computers in Education.
[illegible] Rex; LeCroy, Barbara
[illegible]
[illegible] MF01/PC01 Plus Postage.
[illegible]: Opinion Papers (120)
[illegible]e: Practitioners

Major Descriptors: *Computer Literacy; *Computer Software; *Microcomputers; *Skill Development; *Teacher Education

Before computers will be able to fulfill their potential in education, two major challenges must be overcome—the lack of well-trained teachers and a lack of general knowledge about software and its capabilities. Teachers must acquire some computer literacy skills, including programming, word processing, materials generation and record keeping. In addition, they must be informed of microcomputer applications that are more specific to their discipline and how to integrate these applications into actual lessons. Ability to evaluate software programs is also important; and teachers should look for features that characterize good software, e.g., creativity, instructional objectives, content relevancy and appropriate grade level, screen formatting, adequate instructions, "user friendliness," feedback capabilities, motivational devices, technical quality, good documentation, and teacher utility. Software reviewing sources teachers can use include "The Educational Software Selector," "The Yellow Book of Computer Products for Education," and "The Survey of Early Childhood Software." Teachers training programs should produce educators with enough skills to use the microcomputer as a tool for instructional management, teaching, and classroom management. If educators are to prepare their charges for a place in society, then computers must be given a new place in the schools. Seven steps in evaluating software are listed as well as four references. (JB)

ED265843
Micro-CAI in Education: Some Considerations.
Majsterek, David
1984; 24p. Paper presented at the Montana Council for Exceptional Children Fall Conference on Exceptionality (October 1984).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Information Analyses—General (070); Opinion Papers (120); Speeches/Meeting Papers (150)
Target Audience: Practitioners
Major Descriptors: *Computer Assisted Instruction; *Computer Software; *Discovery Learning; *Learning Disabilities; *Learning Processes; *Microcomputers

This paper focuses on the applications which best suit the microcomputer in an educational setting with emphasis on adapting effective pedagogical practice to the computer's programability and delivery capabilities. Discovery learning and "being told" are identified as two types of computer assistant instruction (CAI) and sample uses of each method are compared and contrasted to identify their strengths and weaknesses. Comparison of these two CIA methods is based on analyses of five components: (1) student reinforcement; (2) full use of the potential of microcomputers; (3) student-computer interactions; (4) knowledge of possible answers and probable mistakes; and (5) existence of an interactive environment. It is pointed out that learning to program in "discovery languages" (LOGO, PILOT) is a powerful skill that all students should have available to them. Implications of CAI for use with special education students are discussed, and specific benefits are suggested for behaviorally disoriented, mentally and physically handicapped, and learning disabled students. Four major components of CAI that assist these students are identified: program patience, program repetition, eagerness of students to use computers, and suitability for discovery learning. Teachers are encouraged to familiarize themselves with programs that teach effectively and to help create programs that ensure superior instruction. A three-page list of references completes the document. (JB)

ED265850
Developing Instructional Applications at the Secondary Level. The Computer as a Tool.
McManus, Jack; And Others
1985; 50p. Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, March 31-April 4, 1985).
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Target Audience: Researchers
Major Descriptors: *Computer Literacy; *Computer Software; *Curriculum Development; *Inservice Teacher Education; *Microcomputers

Case studies are presented for seven Los Angeles area (California) high schools that worked with Pepperdine University in the IBM/ETS (International Business Machines/Educational Testing Service) Model Schools program, a project which provided training for selected secondary school teachers in the use of personal computers and selected software as aids to learning. The major purpose was to determine how microcomputers and software could be used to assist in the existing instructional process at the secondary level. An introduction briefly describes the IBM/ETS Model Schools program objectives, research methods, and techniques used for the case studies. Information is then presented for each of the schools, including the educational setting, microcomputer laboratory set-up, and a description of the computer applications that were developed. In addition, major issues that emerged from the project are discussed for each school: hardware, software, teacher training, time requirements, applications versus programming, school support, and school culture. Recommendations are presented for those planning or developing

microcomputer programs in secondary schools, and eight applications that were developed in the IBM/ETS project are described. These applications used word processing (2), communications (1), a database management system (2), a database and graphics (1), and an electronic spreadsheet (2). A report on a formal course offering that is now part of the Pepperdine University Master of Science Degree in Educational Computing concludes the report. Lists of core software and software options and an outline of a computer curriculum module are appended. (JB)

ED261645
Microcomputer Usage in Schools, 1984-1985.
Quality Education Data, Inc., Denver, CO.
1985; 27p. For the 1983-84 report, see ED 246 848.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Numeric/Quantitative Data (110)
Major Descriptors *Microcomputers; *Public Schools; *School Districts; *Use Studies; *Video Equipment

Results are presented for the fourth annual survey of all U.S. school districts by Quality Educational Data, Inc. Findings are displayed in tabular form and include information on the following: market penetration by major brands of microcomputers in school districts and buildings; school districts that use microcomputers and the brand or combination of brands; growth patterns; relationship between the size of student enrollment and the likelihood of a district having microcomputers; the relationship of instructional dollars per pupil to the presence of microcomputers; shifts in the different brands of microcomputers utilized; the kinds of districts that have microcomputers and specific brands utilized; elementary, junior high, and senior high schools by enrollment with microcomputers; number of microcomputers by brand in the public schools; microcomputer usage by expenditure, enrollment, and grade level; microcomputer units by state; comparison of states with regard to number of students per micro; and the top 50 districts which use microcomputers. (JB)

ED270091
High Tech/High Touch: A Computer Education Leadership Development Workshop. Second Edition.
Moursund, David
International Council for Computers in Education, Eugene, Oreg.
1985; 194p.
Available from: International Council for Computers in Education Publications, 1787 Agate St., Eugene, OR 97403 ($16.00).
EDRS Price—MF01/PC08 Plus Postage.
Document Type: Guides—Classroom—Teacher (052)
Target Audience: Practitioners
Major Descriptors: *Computer Literacy; *Computer Uses in Education; *Group Activities; *Group Dynamics; *Inservice Teacher Education; *Microcomputers

This document contains materials and suggested activities for use in a 5-day workshop on leadership development for instructional computer coordinators, computer education teachers, workshop leaders, teachers of teachers, and other people who play a leadership role in the workshop format in small group discussions, together with sharing and practicing ideas related to the large group presentations. Many of the activities and discussion topics focus on improving communications and interpersonal skills. Organized into 15 sessions, topics addressed include: (1) active listening; (2) computers in instruction; (3) leadership traits; (4) higher-order skills; (5) problem solving; (6) goals of computer education; (7) analysis of the computer-assisted learning (CAL) goal; (8) computer integrated instruction; (9) the computer coordinator; (10) evaluation; (11) the "I Can't Write" syndrome; (12) mathematics education; (13) computer-based information systems (CBIS) in social studies; (14) stress and burnout; and (15) keeping up, final questions, and closure. Material for each session includes a statement of goals, information on the topic covered, and individual and group exercises. Most sessions also provide a list of references. (JB)

ED263911
Programmatic Definition for Computer Education.
Maryland State Dept. of Education, Baltimore. Div. of Instruction.
1983; 11p. Prepared by Task Force on Use of Computers in Instruction. Document is printed in colored ink on colored paper. For related document, see ED 263 912.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Guides—Non-classroom (055); Legal/Legislative/Regulatory Materials (090)
Target Audience: Practitioners
Major Descriptors *Computer Literacy; *Microcomputers

A task force on the use of computers in instruction was appointed by the Maryland Deputy State Superintendent of Schools to respond to requests of state local education agencies for assistance with computer education. One

result of the deliberations of that group is this paper, which establishes the programmatic definition for a comprehensive computer education program for the public schools of Maryland. Divided into three main sections, the paper covers computers as the instructional focus, computers as instructional support, and program recommendations. Goals and subgoals are presented for each of the first two topics; the third lists seven recommendations for local education agencies to follow in implementing computer education programs. A list of task force members completes the document. (JB)

ED264637
Computers and Individualized Instruction: Moving to Alternative Learning Environments.
Robbat, Richard J.
ERIC Clearinghouse on Educational Management, Eugene, Oreg.; International Council for Computers in Education, Eugene, Oreg.
Sponsoring Agency: National Inst. of Education (ED), Washington, DC.
1986; 55p.
Available from: Publication Sales, International Council for Computers in Education, University of Oregon, 1787 Agate Street, Eugene, OR 97403 ($6.00 prepaid; quantity discounts; $2.50 for shipping and handling).
EDRS Price—MF01/PC03 Plus Postage.
Document Type: Information Analyses—ERIC IAP's (071)
Target Audience: Administrators; Practitioners
Major Descriptors: *Computer Assisted Instruction; *Computer Managed Instruction; *Educational Change; *Educational Environment; *Individualized Instruction; *Microcomputers

The overall focus of this booklet is on planning for change that allows for integration of computers into articulated learning environments that will enhance the learning goal of students. The first chapter presents four major themes to increase the likelihood of combining computers and individualized instruction in schools: (1) a revitalized form of computer-assisted instruction (CAI); (2) the utilization of computers by students for their own learning goals; (3) the use of a comprehensive instructional management system; and (4) the willingness of educators to provide alternative educational environments in harmony with technology. Chapter 2 begins the discussion of CAI with a brief history and moves to the four levels of CAI that range from drill and practice to systems that create a model for each student and modify it as learning progresses. Chapter 3 presents a Student-Computer Integrated Learning (SCIL) model that shifts the focus from students being passive recipients to their use of computers as a medium for learning. This model makes extensive use of computer-based simulations. Ways to reorganize schools consistent with SCIL that would personalize an individual's educational experiences are suggested in chapter 4. In chapter 5, a 4-year training program, using the "coaching" model, is proposed for educators and administrators to transfer skills to the educational process. The last chapter describes the need for a sophisticated instructional management system—Educator-Computer Integrated Management (ECIM)—to keep track of the progress of each student. Three pages of references complete the booklet. (MLF)

ED262770
Microcomputers in the Schools: A Case of Decentralized Diffusion.
Rogers, Everett M.; And Others
Stanford Univ., Calif. Inst. for Communication Research.
1985; 128p. Paper presented at the International Communication Association Conference (Honolulu, HI, May 23-27, 1985).
EDRS Price—MF01/PC06 Plus Postage.
Document Type: Reports—Research (143)
Target Audience: Researchers
Major Descriptors: *Adoption (Ideas); *Decision Making; *Microcomputers; *Program Implementation

Utilizing nine schools located in the San Francisco Bay area, a study was conducted to examine the patterns by which microcomputers are accepted and implemented in high schools. Rather than the educational or social effects of this new academic resource, the study focused on: (1) the process of the behaviors and decisions leading to the acquisition of microcomputers, and (2) their subsequent implementation. Answers were sought to questions concerning what caused school administrators and teachers to become interested in educational microcomputers, what academic and administrative tasks are considered appropriate for microcomputers, what causes/enables the adoption of microcomputers, existing barriers to the adoption of microcomputers in schools, and the changes microcomputers bring to the schools that adopt them. Findings indicate that external pressures, rather than sound instructional practice, force educators to adopt microcomputers; school planning is usually insufficient to adapt microcomputers to the curriculum; introduction of the microcomputer produces a great deal of uncertainty and attendant anxiety in schools that adopt it; and, however "fragile" the microcomputer may be, it is probably not a fad that will pass away. Specific case studies of the diffusion of microcomputers in the nine schools, and summaries of site visits to each school, are appended. (JB)

ED267791
Microcomputers and Continuing Motivation.
Seymour, Sherrie L.; And Others
[1986]; 15p. Paper presented at the Annual Convention of the Association for Educational Communications and Technology (Las Vegas, NV, January 16-21, 1986). For entire proceedings, see ED 267 753.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150); Tests/Questionnaires (160)
Target Audience: Researchers
Major Descriptors: *Computer Assisted Instruction; *Difficulty Level; *Intermode Differences; *Microcomputers; *Student Attitudes; *Student Motivation

This study investigated the effects of medium of instruction, task difficulty, and gender on continuing motivation. A total of 139 fifth and sixth graders with previous computer experience completed an initial learning task in one of the two media formats (computer or paper/pencil) and under either a hard or easy difficulty level. Students' choice of instructional medium for a second learning task was the measure of continuing motivation. Of the 69 computer subjects, 67 (97%) chose to return to the computer, whereas only one of 70 paper/pencil subjects (1%) chose to return to the paper/pencil form, $p = .0001$. The remaining 69 chose the computer for the second task. Questionnaire data indicated that computer subjects also evaluated their own performance significantly more highly, reported the task to be significantly more interesting and easier, and had a greater desire to study more of the same type of subject matter. A list of references, two data tables, and questionnaire items and responses are included. (Author/JB)

ED262753
Models of Computer Use in School Settings. Technical Report Series, Report No. 84.2.2.
Sherwood, Robert D.
George Peabody Coll. for Teachers, Nashville, TN. Learning Technology Center.
1984; 38p. To appear as a chapter in *Computers in Education from Literacy to Applications,* by C. Kinzer, R. Sherwood, and J. Bransford. Holt, Rinehart & Winston, 1985.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Reports—Descriptive (141)
Target Audience: Researchers
Major Descriptors: *Computer Assisted Instruction; *Computer Literacy; *Microcomputers; *Models; *Skill Development

Designed to focus on student learning and to illustrate techniques that might be used with computers to facilitate that process, this paper discusses five types of computer use in educational settings: (1) learning ABOUT computers; (2) learning WITH computers; (3) learning FROM computers; (4) learning ABOUT THINKING with computers; and (5) MANAGING learning with computers. Within each section, the method is first discussed in general, then specific examples of software that could be used with each method are described. At the end of each section, three questions are posed and answered that address reasons why the utilization would be useful to students, when the utilization should be considered, and what kinds of skills it would provide. Specific reference is made to such topics as computer literacy, computer literacy courses, development of programming skills, drill and practice software, tutorial programs, simulation software, computer games, writing and problem solving tools, administrative uses for computers, and communication between computers in a school or with machines at other locations. A list of references completes the document. (JB)

ED260687
Computer Assisted Instruction: A Review of the Reviews. Research Report 85-01.
Stennett, R. G.
London Board of Education (Ontario). Educational Research Services.
1985; 15p.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Information Analyses—General (070)
Major Descriptors: *Computer Assisted Instruction; *Computers; *Intermode Differences; *Literature Reviews; *Teaching Methods

This review of the literature on computer assisted instruction (CAI) focuses on the use of CAI with grades K-13, and specifically assesses the relative merits of traditional instruction and CAI in promoting student achievement. Also assessed are the applications of CAI in the area of special education. Three types of reviews are used exclusively: (1) subjective, personal opinion; (2) box score reviews, in which the author gives narrative comments about the studies and reports the proportion favorable to CAI; and (3) meta-analysis, which uses objective procedures to locate studies, quantitative methods to describe study features and their outcomes, and statistical methods to summarize overall findings. The document includes an account of the method of locating studies (the ERIC, Psychological Abstracts, Ontario Educational Resources Information System, and Exceptional Child Educational Resources

databases), a description of the document review, definitions, and the problems of terminology. Five major reviews are included: Vinsonhaler and Bass (1972); Edwards, et al. (1975); Burns and Bozeman (1981); Kulik, J. et al. (1983); and Kulik, C. C. et al. (1984). The paper concludes with six generalizations based on the five reviews and a discussion of the future of CAI use, which includes some recommendations. A five page bibliography is attached. (JB)

ED263881
A Critical Analysis of Computer-Based Approaches to Education: Drill-and-Practice, Tutorials, and Programming/Simulations.
Streibel, Michael J.
1985; 65p. Paper presented at the Annual Meeting of the American Educational Research Association (69th, Chicago, IL, March 31-April 4, 1985).
EDRS Price—MF01/PC03 Plus Postage.
Document Type: Opinion Papers (120); Speeches/Meeting Papers (150)
Target Audience: Researchers
Major Descriptors: *Computer Assisted Instruction; *Computer Simulation; *Computer Software; *Drills Practice; *Programed Tutoring

Three major approaches to the use of computers in education are examined, serious limitations of each are presented, and questions are raised as to the efficacy of technologolizing education. The drill and practice approach is shown to embody a deterministic, behavioral technology that turns learning into a systematically-designed and quality-controlled form of work. Computerized tutorial programs are shown to extend the behavioral and technological approach to learning even further by shaping interactions via an external agent's intentions in order to maximize the learner's performance gains. Most seriously, computerized tutorial interactions pre-empt the personal intellectual agency and ultimately inner-directed learning. Finally, the use of computers is shown to limit the learner's mental landscape to objective, quantitative, and procedural tools. A list of references completes the document. (JB)

Conference Proceedings

ED268964
Proceedings for the 4th Annual Micros on Parade Conference (4th, Houston, Texas, June 7-8, 1985).
Amburgey, Valeria, and Olivier, Terry A., Eds.
Education Service Center Region 4, Houston, Tex.
1985; 117p.
EDRS Price—MF01/PC05 Plus Postage.
Document Type: Collected Works—Proceedings (021); Guides—Classroom—Teacher (052); Computer Programs (101)
Target Audience: Teachers; Practitioners
Major Descriptors: *Computer Assisted Instruction; *Computer Graphics; *Computer Literacy; *Computer Software; *Microcomputers; *Programing

This document contains 25 presentations on five broad topics: the interface of computers with instruction; computer applications; computer graphics; computer programming; and general interest sessions. A foreword by Dr. Valeria Amburgey of Sam Houston State University precedes the following papers: (1) "Fourth and Fifth Grade Computer Centers Soliciting & Utilizing Computer Volunteers" (Susan Wethington); (2) "Apples in the Classroom" (outline only, Dorothy MacDonald and Joann Nelson); (3) " Implementing LOGO in the Elementary Computer Lab" (Joan Brummett); (4) "LOGO—Graphics and Beyond" (Frank Matthews); (5) "LOGO Graphics Work in Apple LOGO, and Can Be Saved on Video with Sound Added" (Peggy Hill); (6) "Story Grammar at the Computer: Models and Process" (Peggy Hill); (7) "Competitive Math Teaching Strategies Using the Computer" (Gaye Russell); (8) "Side Stepping the Essential Elements" (Dena Bankston); (9) "Computer Literacy for the Small Community" (Pam Wood); (10) "Trials and Tribulations of Computer Literacy" (handout, Rita Depree); (11) "Word Processing: A Tool for Learning" (Martha Lawrence); (12) "Welcome to the Big Apple! Appleworks" (Pamela Cho); (13) "Understanding Database Management" (Terry A. Olivier); (14) "Graphic Software: Which Ones to Purchase and How to Use Them" (Gerald Pollard); (15) "Introducing PASCAL through Karel the Robot" (Dell Simon); (16) "Using LOGO to Program Karel" (Nancy Siragusa); (17) "Manipulating the Character Generator" (Betty Carter, Barbara Edwards, and Ken Ismert); (18) "Manipulating Memory on the Apple II Computer" (Jeffery W. Bloom); (19) "Interactive Video and Graphic Special Effects" (Lois E. Gordon Mosely); (20) "Effective Use of Computers in the Science Classroom" (Jeffery W. Bloom); (21) "Hands-On in the Science Classroom" (Nan Porter); (22) "The Rib Strikes Back: Countering Gender Inequities in Computer Use (Danna Fertsch and James R. Aman); (23) "The Home Connection" (Mark Sullivan); (24) "The Computer in the Christian Environment" (Bill Cobb); and (25) "Teaching Junior High Computer Literacy: The Texas Basic in the Summer" (Debbie Roberts). A list of reference books and computer magazines available through the Region IV Education Service Center is included. (THC)

ED265831

Extending the Human Mind: Computers in Education. Proceedings of the Annual Summer Computer Conference (4th, Eugene, Oregon, August 19-21, 1985).

Oregon Univ., Eugene. Center for Advanced Technology in Education.

1985; 351p.

Available from: Proceedings, Center for Advanced Technology in Education, 1787 Agate Street, University of Oregon, Eugene, OR 97403. ($20.00).

EDRS Price—MF01/PC15 Plus Postage.

Document Type: Collected Works—Proceedings (021); Opinion Papers (120); Reports—General (140)

Target Audience: Practitioners

Major Descriptors: *Computer Assisted Instruction; *Computer Literacy; *Microcomputers; *Recordkeeping; *Research Needs

Focusing on ways in which Oregon educators have made use of computers, the 47 papers in this proceedings show substantial progress in some areas and point out some unanswered research, instructional, learning, and management questions. The contents are divided into three general areas: Curriculum Applications, Learning and Teaching, and Classroom and School Management. Each major section is further sub-divided into topic areas which contain from one to four papers each: (1) Elementary Education; (2) Language Arts; (3) Mathematics; (4) Science; (5) Social Studies; (6) Business; (7) Art; (8) Music; (9) Health; (10) Programming; (11) Instructional Design; (12) Problem Solving; (13) Special Education; (14) Computer Networking; (15) Library and Information Systems; (16) Classroom Management; (17) Legal Implications; (18) Computer Coordination; (19) Hardware/Software Purchasing; and (20) Computer Support of School Management. An author index is provided. (JB)

ED272183

Technology and the Longer View. Proceedings of the Annual National Conference on Technology and Education (1st, Ft. Worth, Texas, April 19-20, 1984).

Klier, Betje, Ed.; And Others

Tandy Corp., Ft. Worth, TX. Radio Shack Education Div.; Texas Univ., Austin. Coll. of Education.

1984; 255p.

EDRS Price—MF01/PC11 Plus Postage.

Document Type: Collected Works—Proceedings (021); Opinion Papers (120); Reports—Descriptive (141)

Target Audience: Practitioners; Community

Major Descriptors: *Computer Uses in Education; *Educational Trends; *Information Systems; *Information Technology; *Technological Advancement

To address the challenges to education posed by the new information technologies, participants from 41 states—publishers, administrators, teachers, subject specialists, and leaders from the field of educational computing—gathered to share ideas and visions. This report of the conference proceedings includes introductory comments by John Roach of Radio Shack and Lorrin Kennamer and Nolan Estes of the University of Texas at Austin, and four keynote speeches: "Technology: Developing Our Newest and Greatest Resource" (Donald J. Senese); "Excellence and Equity: Toward the 21st Century" (Ruth Love); remarks by Pierre Duguet; and "From Slates to Silicon" (Patricia Albjerg Graham). The texts of 10 papers presented in "breakout sessions" are also included: (1) "Computer Literacy at the Secondary Level" (Arthur Luehrmann); (2) "Computer Competencies for School Administrators" (Jim Poirot and Ted Mims); (3) "Before You Use It, You Have To Choose It: Purchasing Considerations" (Don Roberson); (4) "Planning for a Computer Curriculum" (Ruth E. Randall); (5) "Communications and the Computer: An Application Study" (Thomas E. McCann); (6) "Foreign Language: Does Your Computer Speak French?" (Betje Klier); (7) "Teaching the Talented and Gifted" (Marianne Marrapodi); (8) "Special Education Software" (Victor Fuchs); (9) "Copyright Issues for Electronic Publishing" (Carol Risher); and (10) "Beyond Instructional Computing: Preparing Students for The Electronic Age" (Michael N. Milone, Jr.). (THC)

ED261648

Microworlds and Expert Systems: Is It Either or Can It Be Both? Report of a Conference Sponsored by the Educational Technology Center (Cambridge, Massachusetts, January 11-12, 1985).

McDonald, Joseph P.

Sponsoring Agency: Educational Technology Center, Cambridge, MA.

[1985]; 7p.

EDRS Price—MF01/PC01 Plus Postage.

Document Type: Collected Works—Proceedings (021); Opinion Papers (120); Reports—Descriptive (141)

Major Descriptors: *Artificial Intelligence; *Computer Software; *Instructional Design; *Microcomputers; *Word Processing

This report summarizes the proceedings of a conference held at the Harvard Graduate School of Education which focused on the conceptual distinction between microworld software and expert system software in education.

Microworld software is defined as software which lacks a specific teaching and learning agenda, and expert systems as software that comes with built-in knowledge of a domain and a built-in plan of instruction in that domain. To assist program presenters in examining the design polarities implied in the two systems, two pairs of educational software systems (carefully chosen to illustrate the polarity) were displayed and discussed. These systems—The LISP Tutor and Geometric Supposer on the one hand and The Writer's Workbench and Quill on the other, provided the basis for subsequent presentations and panel discussion. Presenters noted specific design and utilization differences between Geometric Supposer and LISP tutor: the former is a tool which students may use in an exploratory fashion and the latter makes inferences about a user's intentions at each step of a guided path. Workbench differs from Quill in that that the former, with its original design as an editing tool with explicit technical analysis, precludes its judging the writing product itself, while the latter is designed to help generate writing materials and facilitate writing between student and teacher, or among students. A more in-depth presentation of each of the four systems, along with the presenter's comments on its use and applications, follows the initial comparison of the systems, and closing remarks suggest that the concepts of both types of system should be utilized in an educational environment. (JB)

ED263884
Education = Microcomputers, Classrooms, and Children. Proceedings of the Annual Statewide Conference of Alaska Association for Computers in Education (4th, Anchorage, Alaska, April 4-6, 1985).
Van Dusseldorp, Ralph, Ed.
Alaska Association for Computers in Education, Anchorage.
1985; 195p.
Available from: Alaska Association for Computers in Education, P.O. Box 4-652, Anchorage, AK 99502 ($10.00).
EDRS Price—MF01/PC08 Plus Postage.
Document Type: Collected Works—Proceedings (021); Guides—Non-classroom (055); Reports—Descriptive (141)
Target Audience: Practitioners
Major Descriptors: *Microcomputers; *Programing

These proceedings include 31 papers presented at the 1985 conference of the Alaska Association for Computers in Education. Generally oriented toward the use of microcomputers in elementary and secondary schools, papers deal with both administrative and instructional microcomputer applications. Topics addressed include: microcomputer literacy models, distance education, trends and issues in Logo, computer assisted curriculum development, software copyrights, integrating computer software into the regular school curriculum, PLATO and EDNET, developing courseware to meet the needs of native Alaskans, writing with Quill, Apple Logo projects, use of a microcomputer controlled videodisc player with mentally handicapped students, and sex differences in computer involvement. (JB)

Developing Computer-Based Instruction

ED272137
Educational Strategies for Interactive Videodisc Design.
Deshler, David; Gay, Geraldine
1986; 10p. Paper presented at the Annual Conference of the American Educational Research Association (67th, San Francisco, CA, April 16-20, 1986).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Opinion Papers (120); Speeches/Meeting Papers (150)
Target Audience: Researchers
Major Descriptors: *Computer Assisted Instruction; *Instructional Design; *Interactive Video; *Learning Theories; *Videodisks

This paper discusses various educational strategies for interactive videodisc design that were derived through scanning, synthesizing, and simplifying implications from a wide variety of learning theories. Four initial assumptions about videodisc technology are presented: (1) videodisc systems are more likely to be effective if learning theories inform their design; (2) application of videodisc systems should not be limited to lower levels of behavior or cognitive functioning; (3) the capabilities of interaction (control, feedback, pace) inherent in videodisc microcomputer technology can expand access and multiply the flexible use of visual materials; and (4) combinations of videodisc and microcomputer technologies may give rise to additional instrumentation of learning theory research. Five unique features of the videodisc are also identified and briefly discussed. The major part of the paper focuses on three learning theories—behavioral, cognitive, and humanistic—and videodisc applications for each. It is suggested that educators should continue to evaluate the implications, assets and limitations, and best instructional uses for the videodisc and recognize that this medium can also provide instrumentation for research, particularly on higher order cognitive learning and critical reflectivity. A chart displaying the three learning modes, theoretical traditions, major learning theorists, associated concepts, and potential videodisc utility is provided, as well as a list of references. (JB)

ED272136

Educating Master Authors for Designing Instruction with the New Electronic Technologies: The Making of Michaelangelos.

Fisher, Kathleen M.; Lipson, Joseph I.

1983; 12p. Paper presented at the Annual Conference of the Western Educational Computing Conference (San Francisco, CA, November 17-18, 1983).

EDRS Price—MF01/PC01 Plus Postage.

Document Type: Opinion Papers (120); Speeches/Meeting Papers (150)

Target Audience: Practitioners

Major Descriptors: *Computer Software; *Demand Occupations; *Instructional Design; *Skill Development; *Teacher Education

Although the quality of educational software is increasing dramatically, the need for good instructional software far surpasses the supply. There are at present relatively few authors with the array of knowledge and skills necessary to produce high quality interactive instruction. In the absence of trained authors, much of the available software has been produced by teams of experts who typically have little experience and knowledge. This paper explores the range of skills that may be desirable for creating effective instruction with the electronic media, examines the drawbacks of existing methods of authoring instructional material, and considers the kinds of curricula that would provide education and training in the requisite skills. A course of study is envisioned which would educate "master authors" in: (1) subject matter expertise; (2) artistic and technological skills; (3) instructional design skills; and (4) information processing and learning theory. A 17-item bibliography and brief biographies of the authors are included. (Author/JB)

ED272143

The Future of Education: A Time of Hope and New Delivery Systems.

Heuston, Dustin H.

WICAT, Inc., Orem, Utah.

1986; 72p.

EDRS Price—MF01/PC03 Plus Postage.

Document Type: Information Analyses—General (070); Opinion Papers (120)

Target Audience: Policymakers

Major Descriptors: *Computer Assisted Instruction; *Computer Managed Instruction; *Delivery Systems; *Educational Trends; *Information Dissemination; *Technological Advancement

The educational delivery system in the United States has matured, and investing more funds in the current system will have no effect in terms of effectively training students for tomorrow's society. Among the shortcomings of the current delivery system are limited individual instruction, inconsistent quality of presentation, limits of the teacher labor market, a diverse and rapidly changing student population, lack of information about individual student's needs, and faculty workload problem. However, once a condition exists in a mature delivery system that allows it to do exponentially more work for a reasonable financial investment, a dramatic system improvement is possible and such a condition is present in the advent of the computer. This paper includes discussions of technologies that will be available in new delivery systems, including videodiscs and compact disks, and warns educational leaders about some of the pitfalls of hardware acquisition. Topics discussed include the future of education; shortcomings of the current delivery system and advantages of the new delivery system; cost of implementation; possible productivity gains; technologies of the new delivery system; and the hardware revolution. (THC)

ED265844

Designing Videodisc-Based Courseware for the High School.

Hofmeister, Alan M.; And Others

1985; 26p. Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, March 31-April 4, 1985).

EDRS Price—MF01/PC02 Plus Postage.

Document Type: Opinion Papers (120); Reports—Descriptive (141); Speeches/Meeting Papers (150)

Target Audience: Researchers

Major Descriptors: *Computer Assisted Instruction; *Courseware; *Instructional Development; *Mathematics Education; *Science Education; *Videodisc Recordings

The purpose of this paper is twofold: (1) to outline the issues involved in designing videodisc-based instruction to meet the needs of the public high school, and (2) to describe the approach being used in one project that is developing videodisc-based courseware for high school math and science instruction. The first of two major sections presents a rationale for interactive videodisc instruction, a description of a four-level classification scheme for instructional videodisc configurations, and a discussion of the educational implications of the different levels. It is pointed out

that videodisc-based courseware can be designed to work effectively in both Level 1 and Level 3 delivery systems; this dual approach to courseware development appears particularly suitable for use in public school math and science instruction. The second section summarizes the development of a series of interactive videodiscs, "Core Concepts in Math and Science," including instructional format, development and validation procedures, and observations from the field testing. It is concluded that the combination of interactive videodisc technology, selected instructional design, and mastery learning procedures provided the teacher with a flexible and powerful resource. A list of references is appended. (JB)

SPECIAL APPLICATIONS

Computer Literacy

ED264957
Valuable Alternatives to Keyboarding in Grades K-3.
Ball, Stanley
1985; 20p. Paper presented at the Fall Conference on Perspectives on the Young Child and the Computer (Austin, TX, September 27, 1985).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Opinion Papers (120); Speeches/Meeting Papers (150)
Major Descriptors: *Cognitive Development; *Computer Software; *Elementary School Students; *Kindergarten Children; *Microcomputers

In all likelihood, computer use in early childhood will continue to increase. However, there is reason for concern about how computers will be placed into classrooms, what activities will be chosen for children, what interactions will take place, and whether these interactions will consider appropriate readiness and development levels. Computers should be used to promote cognitive development of young people in the classroom. Such use should: (1) take advantage of the powerful interactive nature of the computer; (2) consider the readiness of the child; and (3) not require sophisticated keyboarding skills. Research and reviews of software suggest that valuable software satisfying these criteria is available. Included in this document is a list of 20 software packages reviewers see as having qualities that promote thought processes in kindergarten children and primary school students. (RH)

ED265935
Teaching Early Childhood Educators and Other Adults How to Use Computers.
Baskin, Linda
ERIC Clearinghouse on Elementary and Early Childhood Education, Urbana, Ill.
Sponsoring Agency: Office of Educational Research and Improvement (ED), Washington, DC.
1985; 3p.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Information Analyses—ERIC IAP's (071); Guides—Non-classroom (055)
Target Audience: Teachers; Practitioners
Major Descriptors: *Adult Learning; *Microcomputers; *Teacher Education; *Teaching Methods

Guidelines for teaching early childhood teachers and other adults about computers and their use are offered. Discussion focuses on how attitudes of the adult learner can impede learning, how the trainer can encourage teachers and other school personnel to learn about computers, and the trainers' "invisible agenda" of educational goals that supplements the program of formal instruction. Trainers are advised to vary the pace and rhythm of instruction; avoid jargon while introducing basic concepts; encourage the development of useful computer habits by learners; recognize that, for adults beginning to learn about computers, memorization of routines is not as effective a strategy as understanding the program; provide explicit models for understanding concepts; and suggest strategies for continued learning. (RH)

ED262761
Microcomputers in Education: A Self-Paced Orientation.
Carey, Doris; Carey, Regan
International Council for Computers in Education, Eugene, Oreg.
1984; 96p. Manual requires Bank Street Writer, Know Your Apple IIe, Apple Presents. . . Apple.
Available from: International Council for Computers in Education, 1787 Agate Street, Eugene, OR 97403-1923 ($10.00).
EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.
Document Type: Guides—Classroom—Learner (051); Collected Works—Proceedings (021)
Target Audience: Practitioners
Major Descriptors: *Computer Literacy; *Computer Software; *Individualized Instruction; *Learning Modules; *Microcomputers

Designed to serve as a self-paced computer course for education students with no experience using microcomputers, this manual contains instructions for operating an Apple IIe microcomputer, its introductory software, and Bank Street Writer, using the DOS 3.3 System Master. The lessons, which contain illustrations and sample screens, include information on the Apple IIe system; using the Apple IIe keyboard; initializing a diskette on the Apple IIe; entering, saving, and loading programs; computer assisted instruction, and word processing. Also included are selected readings: (1) "Computer Literacy: Talking and Doing" (Dave Moursund); (2) "I Don't Know" (Dave Moursund); (3) "Informational Technology and Its Impact on American Education" (Office of Technology Assess-

ment); (4) "Toward Improving Learning Strategies and Personal Adjustment with Computers" (Kenneth Ryba and James Chapman); (5) "Toward a Computer Literate Society—An Elementary School Responsibility" (Kay Walla and Virginia Brubaker); (6) "The Intelligence Amplifier: An Essay on the Design of Computer-Based Curricula" (Michael Moshell); (7) "Should Young Children Work with Microcomputers—Logo before Lego?" (B. J. Barnes and Shirley Hill); (8) "Microworlds" (Glen Bull); (9) "Creating a Logo Environment" (Tim Riordon); (10) "Turtle Fever" (Rick Billstein); (11) "Keyboarding—A Must for Tomorrow's World" (Evelyn Kisner); (12) "Sex Equity: Increasing Girls' Use of Computers" (M. E. Lockheed and S. B. Frakt) and (13) "A Nod to the Novice—#1-6" (Bob Skapura). (JB)

ED264828
Computer Competencies for All Educators in North Carolina Public Schools.
North Carolina State Dept. of Public Instruction, Raleigh.
1985; 38p.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Guides—Non-classroom (055)
Target Audience: Policymakers; Practitioners
Major Descriptors: *Computer Literacy; *Inservice Teacher Education; *Microcomputers; *Minimum Competencies; *Staff Development; *State Programs

To assist school systems in establishing computer competencies for inservice teacher training and personnel hiring guidelines, the North Carolina State Board of Education in 1985 approved the recommendations of a state task force, and identified three levels of computer competencies for teachers (K-12), i.e., competencies needed by all educators, competencies needed for computer utilization in content areas, and competencies needed for computer specialization. This document explains the generic skills needed for each of these levels and lists, by academic subject, specific computer skills needed to incorporate the computer as an instructional and management tool in: (1) Arts Education; (2) Music; (3) Dance; (4) Theatre Arts; (5) Communication Skills; (6) Healthful Living Education; (7) Physical Education; (8) Mathematics Education; (9) Science Education; (10) Second Language Education; (11) Social Studies Education; (12) Vocational Education; and (13) Exceptional Children Education. Requirements, competencies, and program guidelines for Level III, i.e., certification for Instructional Technology Specialist—Computers, are also outlined. (JB)

ED264829
Computer Education: Scope and Sequence (Grades K-12).
Anchorage Borough School District, Alaska.
1985; 323p. For 1984 *Scope and Sequence for Computer Education (Grades K-12)*, see ED 252 188.
EDRS Price—MF01/PC13 Plus Postage.
Document Type: Guides—Classroom—Teacher (052)
Target Audience: Practitioners
Major Descriptors: *Computer Literacy; *Computers; *Computer Science Education; *Objectives; *Programing

A companion volume to *Scope and Sequence for Computer Education (Grades K-12)* (1984), this document outlines the goals and objectives of a school district program designed to assist students to learn to use computers and to develop positive attitudes, values, and motivation as appropriate for each individual's age, needs, and desires. After an introduction and statements of the program's philosophy and goals, a matrix format is used to outline the objectives for each grade from K to 6. The program and instructional objectives are coded to the curriculum areas of science, social studies, mathematics, and language arts; suggested software; and other resources. For grades 7 to 12, descriptions of individual courses include grade level(s), prerequisites, outlines, objectives, and type of instruction for each objective—introduction, expansion, or reinforcement. These courses are: (1) Introduction to Computers, grade 7, 4 to 9 weeks; (2) Introduction to Computer Programming, grades 7 to 8, 9 to 18 weeks; (3) Computer Fundamentals, grades 9 to 12, 1 semester; (4) Information Processing, grades 9 to 12, 1 semester; (5) BASIC 1, grades 9 to 12, 1 semester; (6) BASIC 2, grades 9 to 12, 1 semester; (7) PASCAL 1, grades 10 to 12, 1 semester; and (8) PASCAL 2, grades 10 to 12, 1 semester. The scope matrices for grades K to 12 that conclude the document correlate the objectives for each level with recommended texts, curriculum area/unit, suggested software, and other resources. (JB)

ED268960
Computer Education. Alaska Elementary Curriculum Guide. First Edition [and] Computer Education. Alaska Secondary Curriculum Guide. First Edition.
Alaska State Dept. of Education, Juneau.
1985; 60p.
EDRS Price—MF01/PC03 Plus Postage.
Document Type: Guides—Non-classroom (055)
Target Audience: Practitioners
Major Descriptors: *Behavioral Objectives; *Computer Literacy; *Curriculum Development; *Elementary Education; *Secondary Education

These two curriculum guides are part of a series intended to serve as a model to aid school districts as they develop and review their own curriculum documents. The guides represent a synthesis of input from many sources, both Alaskan and national. Each guide lists topics/concepts, learning outcomes, and sample learning objectives in three columns. Topics/concepts describe the major parts of the subject under consideration and they define broadly the content to be included in the study of each subject area. Learning outcomes describe in general terms the behaviors students are expected to demonstrate as a result of their learning experiences. Sample learning objectives are indicators of student progress toward the stated goals, i.e., the learning outcomes. Both the elementary and secondary computer education curriculum guides are organized around the topics of computer operation, computer application, problem solving, and computers in society. The elementary education curriculum guide is divided into three sections: grades 1-3; 4-6; and 7-8. The secondary education curriculum guide is intended for grades 9-12. (THC)

ED264830
Computer Literacy Act of 1984. Report together with Minority Views [and] Computer Literacy Act of 1983. Report together with Additional Views. To accompany H.R. 3750.
Congress of the U.S., Washington, D.C. House Committee on Education and Labor.
1984; 34p.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Legal/Legislative/Regulatory Materials (090)
Target Audience: Policymakers
Major Descriptors: *Computer Literacy; *Federal Aid; *Federal Legislation; *Microcomputers

These two reports contain supporting material intended to accompany the Computer Literacy Acts of 1983 and 1984 (H. R. 3750). This bill was designed to promote the use of computer technologies in elementary and secondary schools by authorizing: (1) grants to local school districts, particularly in poor areas, to purchase computer hardware; (2) teacher training institutes to improve the technological skills of individuals who are engaged in or preparing to engage in teaching; and (3) a grants program for the evaluation and dissemination to schools of information on educational computer hardware and software. The report of the Committee on Education and Labor (Part 1) includes the text of the 1984 bill; a summary; its legislative history; need for the legislation; provisions of the bill; cost estimates; and minority views on the Computer Literacy Act of 1984. The report from the Committee on Science and Technology (Part 2) includes the text of the 1983 bill; purpose of the bill; background and need for the legislation; a sectional analysis of the bill as amended; committee views; a legislative history; a budget analysis and projection; and additional minority views on the bill. (JB)

ED264849
Computer Literacy Curriculum Guide. Bulletin 1739.
Louisiana State Dept. of Education, Baton Rouge.
1985; 138p.
EDRS Price—MF01/PC06 Plus Postage.
Document Type: Guides—Classroom—Teacher (052)
Target Audience: Practitioners
Major Descriptors: *Computer Literacy; *Course Content; *Curriculum Development; *State Programs

Developed in response to a ruling by the Louisiana State Board of Elementary and Secondary Education that freshmen entering high school in 1985-86 must have one-half credit in computer literacy as a graduation requirement, this curriculum guide outlines a basal course in computer literacy for ninth grade students. The course may also be offered to students at a higher grade level. A brief introduction presents 10 assumptions about the teachers, students, and materials involved in the computer literacy course. Presentation of the course content includes the course outline, course objectives, and activities covering the following topics: (1) the computer's impact on society today; (2) the development of computers; (3) microcomputer hardware, software, and applications; (4) elementary programing; (5) hardware and software selection; and (6) the computer's impact on society tomorrow. Each activity section contains at least two course objectives together with their relationship to the corresponding course content and student activities. A vocabulary list is also provided for each of the sections, as well as suggestions for individual projects for further student exploration and sample test items. A bibliography, which includes periodicals as well as monographs, a set of evaluative techniques for the curriculum, and a list of suggested instructional software complete the document. (JB)

ED262759
[The Computing Teacher. Selected Articles on Computer Literacy.]
Moursund, David; And Others
International Council for Computers in Education, Eugene, Oreg.
1985; 38p. *Computing Teacher*; Nov 1983, Aug-Nov 1984, Apr-May 1985
Available from: International Council for Computers in Education, University of Oregon, 1787 Agate Street,

Eugene, OR 97403.
EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.
Document Type: Collected Works—General (020); Guides—Non-classroom (055); Reports—Descriptive (141)
Target Audience: Practitioners
Major Descriptors: *Computer Literacy; *Microcomputers

This document consists of a compilation of nine articles, on computer literacy, that have been extracted from the 1984-1985 issues of the journal *The Computing Teacher*. The articles include: (1) "ICLEP (Individual Computer Literacy Education Plan): A Powerful Idea" (David Moursund); (2) "Computers, Kids, and Values" (Stephen J. Taffee); (3) "Educational Software Reviews: Where Are They?" (Steven Brown, George C. Grossman, and Nicola Polson); (4) "Preparing Computer-Using Educators" (Margaret L. Moore); (5) "Making the Computer Neutral" (Jo Shuchat Sanders); (6) "Databasing in the Elementary (and Secondary) Classroom" (Kathy Pon); (7) "A Road Atlas for Computer Literacy and Teacher Training" (William E. Baird); (8) "Problem Solving with Data Bases" (Beverly Hunter); and (9) "Starting from Square 1" (Norma C. Piper). Sources for educational software reviews, including review journals and reports, educational computing journals, educational periodicals, and other sources are listed by Brown, Grossman, and Polson, and computer education guidelines for teacher certification and elementary, secondary, and administrator computer literacy competencies are suggested by Moore. (JB)

ED270087
The "Do I Have to Teach Computer Literacy?" Handbook. K-12 Scope & Sequence Guide with Teaching Activities for Each Objective. Master. Revised Edition.
North Clackamas School District 12, Milwaukie, Oreg.
1983; 569p.
EDRS Price—MF02/PC23 Plus Postage.
Document Type: Guides—Classroom—Teacher (052)
Target Audience: Practitioners
Major Descriptors: *Computer Literacy; *Learning Activities; *Learning Modules; *Microcomputers

Designed to provide K-12 teachers in Oregon with a scope and sequence, a listing of resources, and a large collection of ready-to-use activities for teaching computer literacy, this handbook is divided into nine sections which contain computer literacy instruction keyed to behavioral objectives. Topics covered include: (1) the history of computing; (2) career opportunities directly and indirectly related to computers; (3) the use of computers at home, school, and work; (4) current limitations and future uses of computers; (5) a vocabulary of common computer terms; (6) the structure and function of computer systems; (7) the care and operation of computer equipment and storage media; (8) program generation and usage; and (9) the moral and ethical implications of computer technology. The activities are coded to match the goals in the scope and sequence, and applicable grade levels are indicated. Each activity is prefaced with a description that indicates: the title of the activity, the objective the activity falls under, the grade level or levels to which the activity applies, a description of the activity, materials needed, and additional resources, including suggested answers, cross references to related materials, and sources for more information. (JB)

ED260689
Exploratory Computer Literacy Curriculum Guide, Grades K-6. Resource Unit.
Hawaii State Dept. of Education, Honolulu. Office of Instructional Services.
1984; 206p. For the Exploratory Computer Literacy Curriculum Guide, Grades K-6, see ED 256 289. This resource unit is designed to replace the resource section, pages 131-141, of the guide.
EDRS Price—MF01/PC09 Plus Postage.
Document Type: Guides—Classroom—Teacher (052); Tests/Questionnaires (160)
Target Audience: Teachers; Practitioners
Major Descriptors: *Computer Literacy; *Courseware; *Lesson Plans; *Microcomputers; *Models

Designed to coordinate teacher-developed materials in computer literacy, this resource unit is composed of several sections. The first, "Planning for Computer Instruction," provides an outline for developing a school-level computer task force, management procedures for computer labs, and sample student survey forms. The remaining sections provide sample activities for classroom use within the major topics of "Getting Started," "LOGO," "Word Processing," and "BASIC." Each sample activity includes suggestions and guidelines for teachers on: (1) appropriate grade levels; (2) performance expectations; (3) curriculum areas; (4) prerequisites; (5) materials, including hardware, software, and supporting peripherals; (6) classroom management; (7) teacher preparation; (8) pre-computer activities; (9) hands-on activities; and (10) follow-up enrichment activities. The materials reflect the teacher-developer's own environment; variables include size of school, characteristics of student population, accessibility to microcomputers, and teaching style. Supporting materials include a computer literacy software list with notations of grade level, price, and publisher; recommended periodicals for teachers; computer books for students; teacher references; and local resources on computer education. Also included is a table showing the sizes of microcomputer keyboards and reference charts. (JB)

ED264836
Exploratory Computer Literacy Curriculum Guide, Grades 9-12.
Hawaii State Dept. of Education, Honolulu. Office of Instructional Services.
1985; 155p. For similar materials for grades 1-6, see ED 256 289 and ED 260 689.
EDRS Price—MF01/PC07 Plus Postage.
Document Type: Guides—Classroom—Teacher (052)
Target Audience: Teachers; Administrators; Practitioners
Major Descriptors: *Computer Literacy; *Computer Software; *Microcomputers; *Models

Designed to offer direction for classroom teachers and administrators in the development of an exploratory computer literacy program for grades 9-12, this resource unit comprises four major sections, four appendices, and two resource lists. The introductory section provides information on the history of Hawaii's computer literacy program; cites its three parts—an exploratory component, a computer science component, and a vocational-technical component; states this guide's intent to address the exploratory component; and explains the foundations and ration ale for the publication. The section on curriculum addresses such questions as: (1) where this new program will be placed in the curriculum; (2) the instructional modes that will be involved; and (3) the teaching methodology that will be used. Four examples of instructional modes—topic, tutor, tutee, and tool—are explained and prescribed for specific educational situations. Four guidelines are given to assist secondary schools in implementing the exploratory computer literacy program, and five models are listed for delivering exploratory computer literacy via courses, unit content, or computer laboratories. Curriculum guidelines include a taxonomy of goals, objectives, and student expectations for exploratory computer literacy in grades K-12. A scope and sequence chart condenses the taxonomy into essential phases and shows, for grades 9-11 and grade 12, the benchmark grade at which it is recommended that student expectations be met. The final section provides sample activities for classroom use within the major categories of entry level, language arts, mathematics, science, and social studies. Each sample activity includes suggestions for teachers on instructional mode, prerequisites, classroom management materials, time for activity, and teacher preparation. Appendices include an exploratory computer literacy framework, task force recommendations, a glossary of computer acronyms and terms, and bonus activities. Resources listed include teacher references and recommended periodicals, and related films and videotapes. (JB)

ED264835
Exploratory Computer Literacy Curriculum Guide, Grades 7-8.
Hawaii State Dept. of Education, Honolulu. Office of Instructional Services.
1985; 142p. For similar guides for grades 1-6, see ED 256 289 and ED 260 689.
EDRS Price—MF01/PC06 Plus Postage.
Document Type: Guides—Classroom—Teacher (052)
Target Audience: Teachers; Administrators; Practitioners
Major Descriptors: *Computer Literacy; *Computer Software; *Learning Activities; *Microcomputers; *Models

Designed to offer direction for classroom teachers and administrators in the development of an exploratory computer literacy program for grades 7 and 8, this resource unit comprises four major sections, four appendices, and two resource lists. The introductory section provides information on the history of Hawaii's computer literacy program; cites its three parts—an exploratory component, a computer science component, and a vocational-technical component; states this guide's intent to address the exploratory component; and explains the foundations and rationale for the publication. The section on curriculum addresses such questions as: (1) where this new program will be placed in the curriculum; (2) the instructional modes that will be involved; and (3) the teaching methodology that will be used. Four examples of instructional modes—topic, tutor, tutee, and tool—are explained and prescribed for specific learning situations. Four guidelines are given to assist secondary schools in implementing the exploratory computer literacy program, and five models are listed for delivering exploratory computer literacy via courses, unit content, or computer laboratories. Guidelines for curriculum development include a taxonomy of goals, objectives, and student expectations for exploratory computer literacy in grades K-12. A scope and sequence chart condenses the taxonomy into essential phases and shows, for grades 7 and 8, the benchmark grade at which it is recommended that each student expectation be met. The final section provides sample activities for classroom use within the major categories of entry level, language arts, mathematics, science, and social studies. Each sample activity includes suggestions for teachers on instructional mode, prerequisites, classroom management, materials, time required for activity, and teacher preparation. Appendices include an exploratory computer literacy framework, task force recommendations, a glossary of computer acronyms and terms, and bonus activities. Resources listed include teacher references and recommended periodicals, and related films and videotapes. (JB)

ED264971
Developmental Computer Awareness: Responses of Head Start and Kindergarten Children.
Galen, Harlene; And Others
1985; 31p. Paper presented at the Annual Conference of the National Association for the Education of Young Children (New Orleans, LA, November 14-17, 1985).

EDRS Price—MF01/PC02 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Major Descriptors: *Class Activities; *Computer Literacy; *Instructional Innovation; *Kindergarten Children; *Preschool Children; *Recall Psychology

Kindergarten experimental group subjects and Head Start children received classroom instruction about and "hands-on" experiences with computers, while a kindergarten control group received the "hands-on" experiences only. During an initial classroom instructional phase, a mini-unit was employed to introduce 10 computer terms to the children. Components of the mini-unit were: the Hinitz-Galen Matrix boards, age appropriate instructional games, songs, card games, visual aids, and group discussion and activities. Children were asked to name the 10 computer parts in a pretest and two posttests administered at different times. Results indicated that, in general, children in the kindergarten experimental class who were interested in both computer usage and the information in the instructional phase benefited most, in comparison with the kindergarten control and Head Start class. While the children in the control class improved in ability to remember the 10 terms, they generally scored lower than experimental subjects. Head Start class test values generally were approximately equal to or higher than the values obtained for the kindergarten control class, although Head Start children were about 1 year younger than the control subjects. It is concluded that the initial classroom instructional phase appears to have provided advantages to the Head Start and kindergarten experimental children which are not obtained solely by hands-on experience with the computer. (RH)

ED269130
Keyboarding in a Self-Contained Fourth-Fifth Grade Classroom.
Hall, Carol S.
1985; 46p. Paper presented at the North Carolina Educational Microcomputer Conference (Greensboro, NC, October 1-2, 1985) and at the Computer Coordinator's F.O.C.U.S. '85 Workshop (Raleigh, NC, October 29, 1985). Master's Project, University of North Carolina at Greensboro.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Dissertations/Theses—Masters Theses (042); Reports—Research (143); Speeches/Meeting Papers (150)
Major Descriptors: *Computer Literacy; *Elementary School Students; *Keyboarding Data Entry; *Microcomputers; *Reading Ability; *Time Factors Learning

Keyboarding was taught to a group of 26 fourth- and fifth-grade students in a self-contained classroom by an elementary classroom teacher using an Apple IIe microcomputer and two software programs: "Gregg Personal Keyboarding" and "Typing Tutor II." Intervention spanned 52 class days, including pre-, mid-, and posttest days, with each student having approximately 10 minutes of computer time per day. Total time of computer use was approximately 520 minutes per child. The instructional goal of the intervention required that students reach a speed of 20 gross words per minute (gwpm) with three or less errors per minute. Students achieved a mean speed rate of 19.73 gwpm, with an error rate of 5.96 on the 46-word timed writing instrument. Keyboarding scores were examined for differences associated with grade level, sex, reading ability, student access to typewriter or computer at home, and ability to play the piano. (Author/RH)

ED268115
A Collaborative Computer Technology Project.
LeBlanc, Patrice; Zide, Michele Moran
1986; 38p. Paper presented at the Annual Meeting of the Association of Teacher Educators (Atlanta, GA, February 22-26, 1986).
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Speeches/Meeting Papers (150); Reports—Descriptive (141)
Major Descriptors: *College School Cooperation; *Computer Assisted Instruction; *Computer Literacy; *Staff Development

The Computer Technology Project is a collaborative inservice/staff development project with a major goal of familiarizing school administrators, staff, and students with computers and their applications. The participating systems are Fitchburg State College, the Shirley Public School System, and the Lunenburg Public School System. The five-phase program extends over a three-year period and is funded by the Massachusetts Board of Regents of Higher Education. Year one, Phases I and II, involved the administration of pre- and posttests to all staff members in order to measure their knowledge, skills, and attitudes toward computers. Based on the analysis of pre-assessment data, levels of training were determined and implemented. Year two, Phases III and IV, involved implementing the project developed in the first year, including a basic computer literacy program for all students. The goal of the third year, Phase V, is the refinement of the computer management system and the expansion of software resources to meet the needs of low incidence groups. These groups include special education students in the mainstream and in the resource room, students identified as talented and gifted, and students from minority and multi-ethnic backgrounds. The document concludes with pre-posttest assessment forms for the first two years of the program. (Author/CB)

ED260180

Booting Up: A Computer-Assisted Bibliography. An Annotated List of Educational Computer Software for Youth and Adult Literacy Programs.

Marrapodi, Maryann

Literacy Assistance Center, New York, NY.

1984; 13p. For related documents, see ED 260 179-181.

EDRS Price—MF01/PC01 Plus Postage.

Document Type: Reference Materials—Bibliographies (131)

Target Audience: Teachers; Practitioners

Major Descriptors: *Adult Basic Education; *Adult Programs; *Computer Literacy; *Computer Software; *Language Arts; *Literacy Education

This guide is a selected list of 25 software packages and 15 books about educational computing. It is the first step in guiding librarians, teachers, tutors, and other literacy providers to choose the best and most appropriate software for use by their students and staff. Software is divided by these topics: problem-solving software, tool programs or multiuse programs to help solve real problems (word processing programs and filing/database programs), and reading/language arts programs (drill and practice or tutorial programs in the areas of communication arts). For each software package this information is provided: title, source and address, cost, and a brief annotation. Two lists of suggested instructional computing books are provided : general books about computers and education and books on LOGO programming. (YLB)

ED267733

Notebook on Computer Literacy Training. A Plan for Computer Literacy Training for School Personnel.

Mylona, Martha D.

Lesley Coll., Cambridge, Mass.

Sponsoring Agency: Department of Education, Washington, DC. 1984; 63p.

EDRS Price—MF01/PC03 Plus Postage.

Document Type: Guides—Non-classroom (055); Reports—Descriptive (141); Tests/Questionnaires (160)

Target Audience: Practitioners

Major Descriptors: *Bilingual Education; *Computer Literacy; *Curriculum Development; *Elementary School Teachers; *Inservice Teacher Education; *Teacher Aides

This document is designed to assist educators, trainers, instructional designers, program planners, and Title VII program directors involved in the computer education of bilingual children. The presented information will assist in identifying target learner needs in the area of computer utilization and applications. The document describes an initial effort for computer literacy training directed towards the specific needs of a specific group of teachers and teacher assistants at the Silvia School Local Educational Agency (LEA) in Fall River, Massachusetts. The target population consisted of a group of learners who are elementary school teachers and teacher assistants involved in the teaching of bilingual (Portuguese/English) children. The methodology selected for instructional curriculum mapping for each unit of training is a combination of the procedural and hierarchical approaches. This was determined by the nature of the topics of the curriculum, which involved such domains of learning as verbal information, intellectual skills, motor skills, cognitive strategies, and implicit attitudes throughout the curriculum. A needs analysis was the first critical step in identifying the content to be addressed during the short-term computer literacy training. The document includes the following sections: Preface; Rationale; Front-End Analysis; Goals and Objectives; and Training Program Outline. Appendices include: Sample Needs Assessment Instruments, Courseware Evaluation Protocol, News Release, Certificate of Participation, and Sources and Resources. (THC)

ED266908

The Mid-Missouri Small School Computer Consortium: Training Teachers on Their Own Turf.

Phillips, Richard; And Others

ERIC Clearinghouse on Rural Education and Small Schools, Las Cruces, N. Mex.

Sponsoring Agency: National Inst. of Education (ED), Washington, DC.

1986; 98p.

Available from: ERIC/CRESS, Department 12, Box 3AP, New Mexico State University, Las Cruces, NM 88003 ($6.50).

EDRS Price—MF01/PC04 Plus Postage.

Document Type: Guides—Non-classroom (055); Information Analyses—ERIC IAP's (071)

Target Audience: Administrators; Policymakers; Practitioners

Major Descriptors: *Computer Literacy; *Consortia; *Inservice Teacher Education; *Itinerant Teachers; *Rural Education; *Small Schools

Directed primarily toward small school administrators and school boards, this publication describes a consortium of five rural school districts in central Missouri and how they used a traveling teacher to facilitate incorpora-

tion of microcomputer capabilities into the school systems' operation and curriculum. The paper describes the use of the consortium to provide teacher inservice training in each district and discusses curriculum applications of microcomputers. Topics include development of the training program, delivery system, methods of instruction, evaluation of the inservice program, and explanation of the post inservice use of computers in the consortium schools. A discussion of the suggested principles of consortium operation covers the need for a clear advantage to cooperation, optimal number of members, geographic proximity and size of member schools, leadership, organization, finances, and the use of outside resources. Background material includes a description of the roles to be played by small school consortia, a review of literature concerning the use of computer technology in rural schools, and a history of the Mid-Missouri Small School Consortium (MMSSC) with attention to features that made for successful sharing of services. Appendices contain tables showing participant ratings of inservice training topics, characteristics of schools and communities forming the MMSSC and a short list of references. (JHZ)

ED262911
Resolving the Improper Use of Computers at a Selected Elementary School by Providing Computer Training for Teachers.
Rodriguez, Irene
1985; 124p. Ed.D. Practicum, Nova University.
EDRS Price—MF01/PC05 Plus Postage.
Document Type: Reports—Descriptive (141); Dissertations/Theses—Practicum Papers (043)
Major Descriptors: *Computer Literacy; *Course Descriptions; *Elementary School Teachers; *Inservice Teacher Education; *Program Descriptions

In order to keep pace with society's involvement in computer use, schools must prepare students to live and work in a society that uses computers in nearly all aspects of life. The general goal of this practicum was to develop, implement, and evaluate a plan to develop the proper use of computers in a selected school. A total of 21 primary teachers participated in a 10-month computer training in-service program. The in-service program focused on the use of the computer in the educational setting, basic computer concepts and languages, available educational software, and hands-on experience. It was anticipated that this in-service would increase the amount of time spent on computer education, increase the participants' knowledge of computers, and enable participants to demonstrate the proper use of computers in the educational setting. Evaluation data indicated that standards of performance were met for all objectives. Related materials are appended, including outlines of all 20 training sessions. (Author/RH)

ED264847
Statewide Computer Literacy Study. Final Report (and) Appendix.
Systems for Training and Applied Research, Inc., Lexington, KY.
Sponsoring Agency: Alaska State Dept. of Education, Juneau. Office of Educational Technology and Telecommunications.
1983; 96p.
EDRS Price—MF01/PC04 Plus Postage.
Document Type: Reports—Research (143)
Target Audience: Policymakers
Major Descriptors: *Adoption Ideas; *Computer Literacy; *Statewide Planning; *Use Studies

This final report of a statewide computer literacy study for the state of Alaska is divided into several sections. A general introduction provides the history of the project and an outline of its three stages: (1) a national review of the status of computer literacy through a computerized literature search; (2) a telephone survey of representatives of Alaskan school districts and documentation collection from the State Department of Education to determine the status of computer literacy in Alaska; and (3) a 3-day computer literacy workshop for representatives of the educational and industrial sectors. The workshop participants were divided into two major planning groups—one to develop definitions and objectives for citizen computer literacy for the state, and the other to develop definitions and objectives for vocational computer literacy. Sections II-IV of the report provide an in-depth analysis of each of these three phases. In addition, data collected through the telephone survey, a summary of the results, and three conclusions are reported for the second stage of the study. The report of the citizen literacy group is contained in Section III and the report of the vocational computer literacy group in Section IV; Section V presents a summary of the recommendations of both groups. A separately bound appendix contains two keynote addresses, a seven-page selected bibliography, a report of a 1982 school survey, a planning conference participant list, and the agenda for the Alaska Statewide Computer Literacy Planning Conference. (JB)

ED272153
A Head Start in Computer Technology: How Release Time for Teachers Can Give Students an Advantage.
Tucker, Nancy G.
[1985]; 11p.

EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Descriptive (141)
Target Audience: Practitioners
Major Descriptors: *Computer Literacy; *Inservice Teacher Education; *Released Time; *Vocational Education

The Caddo Career Center, a secondary vocational-technical school located in Shreveport, Louisiana, has undertaken an innovative approach to solving two problems common to vocational education: (1) how to provide time for vocational instructors to return to the "world of work" in order to keep up-to-date on computer technology; and (2) how to provide exposure to computer applications for vocational students. An in-school effort to make computer applications possible in all areas began in the 1983-84 school year; vocational educators, on release from time from classes, volunteered to become computer literate. The administration provided substitutes or teachers covered for each other to provide release time. Through creative use of funds made available by the local school board for staff development, trade instructors began cross-training in the summer of 1985; additionally, for one week during the school year while students were in the computer lab, the area instructor went into business or industry or back to school for on-the-job computer training experiences. Students used the lab weekly to learn computer and technology literacy or programming; the schedule also provided time for the students to take a field trip to observe current technology in their field of study. An outgrowth of these activities has been the Technology Fair—a 2-day and evening showcase where students demonstrate computer related technology for parents and prospective students. The Caddo Career Center believes in providing these opportunities so that its students will be prepared to enter the work force and accept and conquer the challenges posed by technological changes. Results of student computer use for the spring of 1985 are appended. (JB)

ED268996
A Survey of Incentives for Staff Development of Computer-Based Instruction.
Winkler, John D.; Stasz, Cathleen
Rand Corp., Santa Monica, Calif.
Sponsoring Agency: National Inst. of Education (ED), Washington, DC.
1985; 12p. Paper presented at the Annual Meeting of the American Educational Research Association (69th, Chicago, IL, March 31-April 4, 1985). For related reports, see ED 268 995, ED 264 839, and ED 265 838.
Available from: Rand Corporation, 1700 Main Street, P. O. Box 2138, Santa Monica, CA 90406-2138 ($4.00).
EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Target Audience: Administrators; Policymakers; Practitioners
Major Descriptors: *Adoption Ideas; *Incentives; *Microcomputers; *Motivation Techniques; *Positive Reinforcement; *Staff Development

Research was conducted to assess the role of staff development in improving the quality of computer-based instruction in grade K-12 schools. The sample consisted of contact persons in 171 districts and interviews were completed with 155 (91%). Results indicate 80% of these districts currently provide inservice computer training to teachers; the median amount available is 25 hours. Most also provide technical assistance to teachers with hardware problems (95%), locating and evaluating courseware (80%), and integrating the microcomputer into the curriculum (65%). The median number of microcomputers found in these districts is 35, or a ratio of two microcomputers per five teachers and three microcomputers per 100 students. Incentives for participation in computer inservice training are not common: the most common are commendations or publicity (47%), release time for classes (41%), salary credit (36%), and guaranteed access to microcomputers (35%). The most important incentive was among those least commonly found in this sample—a guarantee of computer access. It was found that traditional incentives dispensed by administrators to teachers have little effect in fostering teacher involvement with computers and distinctions between "extrinsic" incentives such as salary credit and "intrinsic" incentives such as professional recognition did not prove to be conceptually or empirically important. A bibliography is appended. (JB)

Copyright

ED263898
Simulation Game: Senate Committee Hearing on Software Copyright Laws.
Hannah, Larry
1985; 50p.
Available from: International Council for Computers in Education, University of Oregon, 1787 Agate Street, Eugene, OR 97403-1923.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Guides—Classroom—Learner (051); Guides—Classroom—Teacher (052)

Target Audience: Teachers; Students; Practitioners
Major Descriptors: *Computer Software; *Copyrights; *Educational Games; *Role Playing; *Simulation

Designed to simulate a Senate committee hearing on software copyright laws, this role-playing game exposes students to a wide variety of viewpoints about software copying, including piracy. The game is structured to bring out as many points of view as possible; the goal of the simulation is exposure to these various points, not the final committee vote. Each of the lobbying groups has been given a list of arguments supporting its position on the proposed legislation. It will be the task of opposing groups to point out any fallacious information these groups present. The game is intended to be played over three days: activities on Day 1 introduce the game and the topic of software copying. Roles are then described and assigned, and the players are given time to prepare for their roles. Day 2 is devoted to testimony by the lobbyist groups and questions by the senators. Day 3 begins with rebuttal testimony by the lobbying groups and the senators' questioning. After a recess, the voting is conducted and reporters read their news stories to the group. The simulation concludes with a review of the game conducted by the instructor. (JB)

ED262758
ICCE Policy Statement on Network and Multiple Machine Software.
International Council for Computers in Education, Eugene, Oreg.
[1985]; 16p.
Available from: International Council for Computers in Education, University of Oregon, 1787 Agate Street, Eugene, OR 97403.
EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.
Document Type: Legal/Legislative/Regulatory Materials (090); Guides—Non-classroom (055)
Target Audience: Practitioners
Major Descriptors: *Computer Software; *Copyrights; *Microcomputers

Designed to provide educators with guidance for the lawful reproduction of computer software, this document contains suggested guidelines, sample forms, and several short articles concerning software copyright and license agreements. The initial policy statement calls for educators to provide software developers (or their agents) with a district-level approved written policy statement which includes the responsibilities of both the educator and the school, and lists the responsibilities of the hardware vendor and the software developer/vendor in assisting educators to observe copyright laws and publishers' license agreements. Four attachments contain a suggested school district policy on software copyright, a software policy for a community college with a large microcomputer lab, a suggested format for software licensing, and some technical notes on software encryption for software/hardware vendors. Four articles on computer software copyright conclude the document: "Software Copyright Interpretation" (LeRoy Finkel); "Computers, Software and the Law" (David G. Novick); and "Right and Wrong in Educational Computing" (David G. Novick). (JB)

Equity Issues

ED268203
Modern Technology and Urban Schools.
Fullilove, Robert E., III
[1985]; 29p. *The State of Black America*; p37-64 1985
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Reports—Descriptive (141); Journal Articles (080)
Major Descriptors: *Black Students; *Computer Assisted Instruction; *Computer Literacy; *Equal Education; *Mathematics Education; *Urban Education

This paper discusses the use of computers in urban schools and mathematics education as it relates to computer literacy, especially for black students. First, the importance of computer literacy as an entry to the technological workplace is emphasized and computer literacy is defined. Mathematics education is presented as an important step in achieving computer literacy. Research findings from other studies on access to and use of computers show that urban and Title I schools report heavy emphasis on computer-mediated remedial/basic skills instruction and suggest that computers are less accessible in predominantly minority elementary schools than in white schools. The lack of exposure of minority students to computers and information science is cited as a danger to their future in the workplace. Statistics show that black students fall far behind white students in mathematics education, but there are programs that have successfully challenged black students to achieve in mathematics. The Professional Development Program of the University of California at Berkeley is profiled. In conclusion, it is recommended that black students must be given access to computers; efforts must be substantially increased to help black students become computer literate rather than use computers for drill or remedial instruction; and steps must be taken to increase black students' proficiency in mathematics. Tables giving the data from studies are appended. (CG)

ED261668
Reflections from the Computer Equity Training Project.
Sanders, Jo Shuchat
Women's Action Alliance, Inc., New York, N.Y.
Sponsoring Agency: Women's Educational Equity Act Program (ED), Washington, D.C.
1985; 13p. Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, March 31-April 4, 1985).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Opinion Papers (120); Reports—Descriptive (141)
Target Audience: Researchers
Major Descriptors: *Computer Literacy; *Equal Facilities; *Females; *Sex Discrimination; *Sex Stereotypes

This paper addresses girls' patterns of computer avoidance at the middle school and other grade levels. It reviews the evidence for a gender gap in computer use in several areas: in school, at home, in computer camps, in computer magazines, and in computer-related jobs. It compares the computer equity issue to math avoidance, and cites the middle school years as a time when these become evident. Also provided is a description of the work of the federally-funded Computer Equity Training Project, conducted by the Women's Action Alliance, including its activities, conclusions on the causes of the gender gap, and the development of a book of strategies for teachers to counter girls' computer avoidance. Several conclusions are presented about the implementation of a computer equity program in a school, and implications for action and research by sex equity professionals are listed. (Author/JB)

ED272138
[IDEAS For Equitable Computer Learning.]
Schubert, Jane G.; And Others
American Institutes for Research in the Behavioral Sciences, Palo Alto, Calif.
[1984]; 76p.; For a digest incorporating some of these ideas, see ED 263 910.
Available from: American Institutes for Research, P.O. Box 1113, Palo Alto, CA 94302 ($9.00).
EDRS Price—MF01/PC04 Plus Postage.
Document Type: Guides—Non-classroom (055); Reports—Research (143); Tests/Questionnaires (160)
Target Audience: Practitioners
Major Descriptors: *Computer Uses in Education; *Equal Education; *Microcomputers; *Sex Fairness

Designed to assist educators in improving computer learning opportunities for students, this packet of materials presents practical strategies that address 12 barriers to equitable instruction: (1) lack of encouragement for females and minority students to use computers; (2) potential value of computer learning more apparent to males than females; (3) bias against females and minorities in software and advertising; (4) prerequisites irrelevant for computer access and instruction; (5) limited computer access for females during free time at school; (6) underrepresentation of females and minority students in computer clubs; (7) dominance by one student over another during computer time; (8) pressure from peers not to participate in computer activities; (9) underrepresentation of females in computer leadership roles; (10) inappropriate location of computers within schools; (11) inability of teachers and students to recognize and deal with problems in computer learning; and (12) shortage of qualified personnel for computer learning. For each of the barriers, a 3- to 4-page leaflet presents illustrations and discussion of situations that constitute the barrier; suggestions for appraising whether the illustrated problem exists in a particular setting; activities for developing awareness among staff and students about the problem and its consequences; suggested actions for improving the computer learning environment; and ways to assess whether the actions have been effective. In addition, IDEAS includes a computer survey for students, an educator's self-assessment questionnaire, discussions of and suggestions for early childhood computer readiness and out-of-school computer access, and a bibliography of selected references in the areas of gender equity and computer education. (Author/JB)

Evaluation

ED262757
Article Reprints from *The Computing Teacher* on Software Evaluations.
International Council for Computers in Education, Eugene, Oreg.
1985; 25p.
Available from: International Council for Computers in Education, University of Oregon, 1787 Agate Street, Eugene, OR 97403.
EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.
Document Type: Collected Works—General (020); Guides—Non-classroom (055); Opinion Papers (120)
Target Audience: Practitioners
Major Descriptors: *Computer Software; *Instructional Material Evaluation; *Media Selection

Reprinted from the *The Computing Teacher*, this collection of nine articles presents information on computer

software selection and evaluation. The articles include: (1) "The DISC Model for Software Evaluation and Support Material Design" (Shelley Yorke Rose and Carol Klenow); (2) "Selecting Computer Software—We Take It Seriously" (Jean Donham); (3) "How Do Teacher and Student Evaluations of CAI Software Compare?" (Barbara Signer); (4) "The Software Selection Process: Some Management Questions" (Anne Batey); (5) "Enrichment Courseware for Middle School Mathematics" (Lois Edwards); (6) "Computers in Science Education" (Richard C. Adams); (7) "Doing Science" (Richard C. Adams); (8) "Statistically Speaking" (Carl Edeburn); and (9) "Bank Street Writer—Does the Tool Define the Process or Vice Versa?" (Randall Boone). Individual articles include a list of approved instructional software for the Iowa City Community School District (Donham); a sample student software questionnaire (Signer); and reviews of sample science education software (Adams). (JB)

ED261646
Microcomputers: Data Base Management Software. Evaluation Guide Number 7.
Gray, Peter J.
Northwest Regional Educational Lab., Portland, OR. Research on Evaluation Program.
Sponsoring Agency: National Inst. of Education (ED), Washington, DC.
[1984]; 13p.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Guides—Non-classroom (055)
Target Audience: Practitioners; Researchers
Major Descriptors: *Computer Software; *Databases; *Management Information Systems; *Microcomputers

This manual on microcomputer-based database management programs provides a description of the key characteristics of database software as well as guidelines for designing a database, uses of database programs, and selecting the right software. Three sets of concepts related to database management are listed and explained: creating a database, using a database management system, and generating reports from the information in a database. Specific directions elaborate on each concept, i.e., generating a master list of fields for use as a guide to selecting an appropriate software program, use of default systems, search strategies, and use of four different formats in creating a report (page format, data format, sort format, and select format). A six-step process is recommended for designing a database: (1) determine goals; (2) specify the data needed; (3) design the reports; (4) set up the database; (5) revise; and (6) pilot test A list of eight sample uses for database programs includes: personnel records, study participant records, test item banks, equipment and supply logs, contact and activity logs, financial statements, consultant records, and references in the literature. A seven-step process is also suggested for evaluating individual software programs. (JB)

ED272184
Microcomputers: Word Processing. Evaluation Guides. Guide Number 3.
Gray, Peter J.
Northwest Regional Educational Lab., Portland, Oreg.
Sponsoring Agency: National Inst. of Education (ED), Washington, DC.
[1984]; 11p. A product of the Research on Evaluation Program.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Guides—Non-classroom (055)
Target Audience: Researchers
Major Descriptors: *Computer Software; *Evaluation Methods; *Microcomputers; *Word Processing

Designed to provide guidance in selecting the appropriate microcomputer-based word processing program, this document discusses the key characteristics of word processing software, including formatting, editing, merging, and printing. Possible capabilities of word processing features are identified, i.e., indent, tab, center, creation of footnotes, insertion, deletion, text movement or copy, word search and/or replacement, spelling checkers, margin justification, headers and footers, sequential printing of multiple files, interruption and resumption of printing, and display of formatted text. Eleven uses of word processing programs are listed, and suggestions are made for selecting the appropriate software package: (1) describe projected uses of the program; (2) identify the features needed; (3) plan ahead for new needs; (4) consider restraints (e.g., price, hardware, printer features) and user preferences that could prove limiting; (5) prioritize desired features; (6) examine and compare products; and (7) consider availability of support—will there be someone to talk to if problems arise after the purchase is made? Lists of references and guidebooks in this series are appended. (JB)

ED272187
Microcomputers: Communication Software. Evaluation Guides. Guide Number 13.
Gray, Peter J.
Northwest Regional Educational Lab., Portland, Oreg.
Sponsoring Agency: National Inst. of Education (ED), Washington, DC.
[1984]; 13p. A product of the Research on Evaluation Program.
EDRS Price—MF01/PC01 Plus Postage.

Document Type: Guides—Non-classroom (055)
Target Audience: Researchers
Major Descriptors: *Computer Networks; *Computer Software; *Data Processing; *Evaluators; *Microcomputers

This guide discusses four types of microcomputer-based communication programs that could prove useful to evaluators: (1) the direct communication of information generated by one computer to another computer; (2) using the microcomputer as a terminal to a mainframe computer to input, direct the analysis of, and/or output data using a statistical analysis program; (3) searching large databases maintained on a mainframe computer; and (4) using a microcomputer to send an eceive personal messages . The key characteristics of telecommunications are discussed and 11 important telecommunications terms are defined. Additional topics addressed include: software typically used for telecommunications; the hardware required, i.e., a modem and interface; primary characteristics to look for in a modem; choosing the right telecommunication system; key characteristics of networking; considerations regarding multi-users systems; and basic system costs. It is noted that a multi-user system includes these five components: the hardware; the interface; the master controller (either a chip on the expansion card, a hard disc drive, or a dedicated computer); the system server; and the wiring to connect the system parts. Evaluators are cautioned that, while multi-user and networking systems are very appealing, at the present time they are not realistic because of copy protection procedures used by most software companies and the cost of multi-user versions of software. A list of references is provided. (JB)

ED272189
Microcomputers: Software Evaluation. Evaluation Guides. Guide Number 17.
Gray, Peter J.
Northwest Regional Educational Lab., Portland, Oreg.
Sponsoring Agency: National Inst. of Education (ED), Washington, DC.
[1984]; 26p. A product of the Research on Evaluation Program.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Guides—Non-classroom (055); Tests/Questionnaires (160)
Target Audience: Researchers
Major Descriptors: *Computer Literacy; *Computer Software; *Evaluation Criteria; *Evaluation Methods; *Microcomputers

This guide discusses three critical steps in selecting microcomputer software and hardware: setting the context, software evaluation, and managing microcomputer use. Specific topics addressed include: (1) conducting an informal task analysis to determine how the potential user's time is spent; (2) identifying tasks amenable to computerization and matching them with existing programs; (3) hardware options; (4) screening of software; (5) sources for software evaluations; (6) criteria for software evaluation, e.g., ease-of-use (set-up, installation, initial learning, and use after initial learning), program performance (speed, error handling, and versatility), and support (printed documentation, on-screen documentation, and supplier/manufacturer); (7) software selection; and (8) services, training, and facilities necessary to manage computer use. Appendices include a software evaluation summary form and a software evaluation worksheet, which provide suggestions for rating software on the specific components of the major evaluation criteria specified in the guide. Three references are listed. (JB)

ED260710
MicroSIFT Courseware Evaluation. [Set 13 (294-319), Set 14 (320-361), with Hardware (HRD) and Subject (SBJ) Indexes to Both Sets.]
Northwest Regional Educational Lab., Portland, Oreg.
[1985]; 119p. For previous documents in this series, see ED 249 918.
EDRS Price—MF01/PC05 Plus Postage.
Document Type: Information Analyses—General (070); Reference Materials—Directories/Catalogs (132); Reports—Evaluative (142)
Target Audience: Practitioners
Major Descriptors: *Computer Assisted Instruction; *Course Evaluation; *Courseware; *Educational Games; *Microcomputers

This document consists of 68 microcomputer software package evaluations prepared by MicroSIFT (Microcomputer Software and Information for Teachers) Clearinghouse at the Northwest Regional Education Laboratory. There are 26 packages in set 13 and 42 in set 14. Each software review lists producer, time and place of evaluation, cost, ability level, subject, topic, medium, required hardware and software, preview policy, instructional purposes and techniques, available documentation, instructional objectives and prerequisites, content and structure, estimated student time required, potential uses, major strengths and weaknesses, and additional comments. An evaluation summary rates each package on 21 criteria. The titles in Sets 13 and 14 are as follows: Addition Logician; Anagramas Hispanoamericanos; Circuit Lab; Electronic Study Guide for Trigonometry; Exploring Tables and Graphs—Level 1 and 2; Geoart; Geography Series—New England; La Corrida De Toros; Mission—Algebra; Mots Croises et Mot Secret; Number Farm; Osmotic Pressure; PLATO French Series; PLATO German Series; PLATO Spanish Series; Poker Parat; Practical Grammar—Complex Sentences—Adjective Clauses; Practical Grammar Part I—Principal

Parts of Verbs; Ratio and Proportion ; Reading Adventure I; Savoir Ecrire; The Linguist; The Observatory; Trap-A-Zoid; U.S. Geography Quiz; Vocabulary Adventure I; Addition and Subtraction; Addition 6-10, Subtraction 6-10 and Addition and Subtraction 6-10; Andy and the Math-A-Sizer; Bank Street Storybook; Basic Skills Courseware—Third Grade, Fifth Grade, Ninth Grade; Beginning Consonants and Ending Consonants; Buzz, Bang, Harvey; Creature Creator; Dinosaur Days; Early Learning Series—Volume I; English SAT II; Exploring Sorting Routines; Fay—That Math Woman; Foreign Language Series—Latin; Fraction Fun with Fraction Man, Level 1; Greek Mythology; Learning about Numbers; Letters and First Words; Mathematics Life Skills, Volume 1—Money Manager; Mathematics Word Problems—Grade 1; Mind Benders A1, A2, and A3; Modern Biology Study Disk; Payroll System—A Business Simulation; Poker Listo; Practical Algebra—Algebra Word Problems; Practical Geometry Series—Triangles; Preschool Activities for Learning; Purchase Power; Reading Klooz; Santa Fe Trail; Spanish Vocabulary Game; Special Topics in Mathematics—Bases Other Than Ten; Spellagraph; Spelling Worksheet Generator; Sports Problems III; T. Rex; Voyage of the Mimi—Introduction to Computing; Word Benders—Phrases, A-1; Word Benders—Similarities, C-1; and Wordfinder. (JB)

ED263913
MicroSIFT Courseware Evaluations [Set 15 (362-388) and Set 16 (389-441), with an Index Listing the Contents of Each Set (Sets 1-16) and a Cumulative Subject Index (Sets 1-16)].
Northwest Regional Educational Lab., Portland, Oreg.
1985; 175p. For previous documents in this series, see ED 226 765, ED 234 722, ED 239 606, ED 245 666, ED 249 918 and ED 260 710. These two sets are the last evaluations by MicroSIFT to be published in this format.
EDRS Price—MF01/PC07 Plus Postage.
Document Type: Reference Materials—Directories/Catalogs (132)
Target Audience: Practitioners
Major Descriptors: *Computer Assisted Instruction; *Courseware; *Educational Games; *Microcomputers

This document consists of 80 microcomputer software package evaluations prepared by the MicroSIFT (Microcomputer Software and Information for Teachers) Clearinghouse at the Northwest Regional Education Laboratory. Set 15 consists of 27 packages; set 16 consists of 53 packages. Each software review lists producer, time and place of evaluation, cost, ability level, subject, topic, transfer medium, required hardware and software, preview policy, instructional purposes and techniques, available documentation, instructional objectives and prerequisites, content and structure, estimated student time required, potential uses, major strengths and weaknesses, and additional comments. An evaluation summary rates each package on 21 criteria. The titles in Sets 15 and 16 are as follows: Addition Circus; Algebra Series; Alphabet Harvey; Content Area Reading—Literature; Crypto Cube; Decimals—Multiplication and Division; Fay's Word Rally; Food for Thought; Fraction Fun with Fraction Man; The Gram mar Examiner; Language Arts—Parts of Speech; Math Maze; Mathematics—Grade 3; Mathematics Activities Courseware—4; Mathematics Activities Courseware—7; Mathsheet; More Powers to You!; Myths, Magic and Monsters; Play on Words; Political Genie; Spellakazam; Spellicopter; States; States and Capitals; Supermind; Typing; Verbs—Action/Linking Verbs; 4-H Ding Darling Soil, Water, Wildlife Project; The ABC's of Programming Your Apple; Arith-Magic II; The Basics of BASIC; Biology Challenge; Brain Booster; Computer Science I; Cosmic Carnival; Countdown, TestSimulator, Authoring and Management System; Discover—A Science Experiment; Earth Science Series—Ground Water; Earth Science Series—Hydrologic cycle; Earth Science Series—Moisture in the Atmosphere; Earth Science Series—Surface Water; Food Group Puzzels; Galactic Prospector; Graphical Analysis II; GUIDEMASTER Borrowing—Regrouping for Subtraction; Holt Reading Skills Extender 3; Hometown; How a Bill Becomes Law; How to Weight an Elephant; Internal Journey; Law in American History; The Magic Cash Register; Math Power Program—Whole Numbers; Math Worlds—Exploring Math with Computers; Microcourse Mathematics—Solving Story Problems—Whole Numbers, Levels 3-6; Modeler—Molecular Design Editor; Operation Frog; PAVE—Perpetual Accuracy/Visual Efficiency Training; Proportions and Per Cents; QuizWhiz; Relevant Reading Through Science I, II, III, and IV; Science Trivia Challenge; Scrambled Eggs; Secrets of Science Island; Shark Attack!—Math Series; States and Traits; Solar Reading—Flight 1—Central Thought; Sorting Techniques, I, II; Stickybear Spellgrabber; Story Tree; Subject-Verb Agreement; U.S. History Databases for PFS: File; The Voyage of the Mimi—Ecosystems with Island Survivors; The Voyage of the Mimi—Whales and Their Environment with the Bank Street Laboratory; What's My Logic?; WordMath; The Writing Workshop; and You Are What You Eat. Also included are an index listing and cumulative subject index for MicroSOFT Sets 1-16. (JB)

ED262747
The National Education Association's Educational Computer Service. An Assessment.
Software Publishers Association, Washington, DC.
1985; 12p.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Evaluative (142)
Major Descriptors: *Computer Software; *Instructional Material Evaluation; *Marketing

The Educational Computer Service (ECS) of the National Education Association (NEA) evaluates and distributes educational software. An investigation of ECS was conducted by the Computer Education Committee of the Soft-

ware Publishers Association (SPA) at the request of SPA members. The SPA found that the service, as it is presently structured, is deficient in three major respects: structure, evaluation fees, and licensing tie-in. First, the organizational form of ECS conflicts with its stated mission of rewarding and encouraging development of quality educational software. The closeness of the tie between the service and Cordatum (the consulting firm which provided funds for the start-up of the service as well as technical and administrative assistance) leads SPA to the conclusion that the evaluation program is secondary to the profit-making interests of Cordatum. Second, there is little justification for the assessment of evaluation fees, a problem compounded by the uneven manner in which these fees have been levied. Third, there is an inherent conflict of interest in linking software evaluations with software sales of approved products by Cordatum. For all these reasons it is recommended by SPA that publishers seek product evaluations by other educational services. A list of organizations that conduct evaluations and a selected list of software firms with established reputations among educators are appended. (Author/MBR)

ED267122
A Criterion-Based Approach to Software Evaluation.
Owston, Ronald D.; Dudley-Marling, Curt
1986; 18p. Paper presented at the Annual Meeting of the American Educational Research Association (70th, San Francisco, CA. April 16-20, 1986).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Speeches/Meeting Papers (150); Reports—Descriptive (141)
Target Audience: Researchers
Major Descriptors: *Computer Software; *Evaluation Methods; *Models; *Reliability; *Validity

The overall poor quality of educational software on the market suggests that educators must continue efforts to evaluate available packages and to disseminate their findings. In this paper, weaknesses in published evaluation procedures are identified, and an alternative model, the York Educational Software Evaluation Scale (YESES), is described. The rationale for this criterion-based model is drawn from the fields of the assessment of student writing, criterion-referenced testing, and the assessment of second language oral proficiency. Four charactertistics important for evaluation were identified from an analysis of published evaluation guidelines: (1) pedagogical content; (2) instructional presentation; (3) documentation; and (4) technical adequacy. Data are presented on the mean ratings of software evaluated with the model, scale intercorrelations, and indicators of its validity and reliability. Feedback indicates that YESES is best used as an initial screening device to narrow the choice of software to a manageable few that can be examined in detail, and as a summative evaluation instrument. (Author/PN)

ED262762
Software Reviews.
International Council for Computers in Education, Eugene, Oreg.
[1985]; 40p.
Computing Teacher; Mar 1983-May 1985.
Available from: International Council for Computers in Education, University of Oregon, 1787 Agate Street, Eugene, OR 97403.
EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.
Document Type: Collected Works—General (020); Guides—Classroom—Teacher (052)
Target Audience: Teachers; Practitioners
Major Descriptors: *Computer Software; *Microcomputers

Reprinted from *The Computing Teacher*, this document contains software reviews for 23 computer programs that educators could use in the classroom or for administrative purposes. Each review describes the program by listing the program title, subject, producer, grade level (if applicable), hardware required, cost, and reviewer's name and professional affiliation. In addition, some reviews contain the program author or publisher's response to the critique. Programs reviewed include: (1) Gertrude's Secrets; (2) Gertrude's Puzzles; (3) Rocky's Boots; (4) The Print Shop; (5) Letters and First Words; (6) Delta Drawing; (7) Turtle Tracks; (8) Microcomputer Physics Lab—Heat; (9) Precision Timer; (10) Graphical Analysis; (11) Ray Tracer; (12) Characteristics of a Scientist; (13) Geography Search; (14) Kidwriter; (15) Story Maker; (16) Bank Street Story Book; (17) Story Tree; (18) Bank Street Writer; (19) Bank Street Speller; (20) Appleworks; (21) Quill; (22) Musicland; and (23) Bank Street Musicwriter. (JB)

Guidance

ED268451
Guide to Developing a Computer Enhanced Counseling Program.
Bleuer, Jeanne; Walz, Garry R.
ERIC Clearinghouse on Counseling and Personnel Services, Ann Arbor, Mich.
Sponsoring Agency: National Inst. of Education (ED), Washington, DC.
1985; 136p. Appendix C (computer search) contains small print.

Available from: ERIC/CAPS, 2108 School of Education, University of Michigan, Ann Arbor, MI 48109-1259 ($5.00).
EDRS Price—MF01/PC06 Plus Postage.
Document Type: Information Analyses—ERIC IAP's (071); Guides—Non-classroom (055)
Target Audience: Counselors; Practitioners
Major Descriptors: *Computers; *Computer Software; *Counseling; *Counseling Techniques; *Program Guides

This document is a guide for computer enhanced counseling program development. An introductory overview on counselors and computers focuses on the use of microcomputers, the use of computers in test scoring and record-keeping, and computer-assisted career guidance systems. Other chapters include the following: (1) Becoming a Computer Literate Counselor; (2) Designing a Computer Enhanced Counseling Program; (3) Locating Resources; (4) Putting Your Plan into Action; (5) Preparing for Accountability; (6) Sharing Ideas and Resources; and (7) Generalizations about Counseling and Computers. Appendices include a list of recommended resources, sample exercises in the BASIC computers language, an ERIC computer search, an ERIC reproduction release form, and a CAPS:HITECH electronic network application form. (ABL)

ED266391
Guidelines for the Use of Computer-Based Career Information and Guidance Systems.
Caulum, David, and Lambert, Roger, Eds.
Association of Computer-Based Systems for Career Information, Eugene, OR, Clearinghouse.
1985; 19p. Paper originally presented at the Annual Convention of the American Association for Counseling and Development (New York, NY, April 2-5, 1985). For related documents, see ED 266 389 and ED 266 392.
Available from: Association of Computer-Based Systems for Career Information (ACSCI) Clearinghouse, 1787 Agate Street, Eugene, OR 97403 ($3.00/copy).
EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.
Document Type: Guides—General (050); Speeches/Meeting Papers (150)
Target Audience: Administrators; Counselors; Practitioners

This document presents guidelines developed by the Association of Computer-Based Systems for Career Information (ACSCI) for integrating computer-based career information systems into the larger guidance or career development program. This guide is intended for counselors and others who assist students and clients at a user site. For purposes of the guidelines, user site personnel are grouped into three categories by their required level of knowledge about the system: the counseling and information staff need the most knowledge; followed by incidental staff users; and finally by administrators, students, and clients. It is recommended that these guidelines be used to: (1) facilitate a computer-based system's implementation and use; (2) aid in assessing system effectiveness; and (3) assure that resources devoted to the system are invested under guidelines that insure their most efficient and effective use. The guidelines are organized into seven main headings with three to six guidelines under each heading. The categories include theory and practice, process, user needs, system site management, physical environment, personnel, and evaluation. Most guidelines are followed by questions designed to test the extent to which those guidelines are being observed. (NRB)

ED266390
Directory of State-Based Career Information Delivery Systems, 1985-86.
Association of Computer-Based Systems for Career Information, Eugene, OR, Clearinghouse.
1986; 96p. For related documents, see ED 266 389, and ED 266 391-392.
EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.
Document Type: Reference Materials—Directories/Catalogs (132)
Major Descriptors: *Career Counseling; *Computer Oriented Programs; *Delivery Systems; *Information Systems; *Job Search Methods

This document is the 1985-86 directory of the Association of Computer-Based Systems for Career Information (ACSCI). An introduction states that 41 states, the District of Columbia, and Puerto Rico have computer-based career information systems (CIDS) used by over 4,500,000 adult and student job seekers. Two-thirds of the systems are in elementary and secondary schools with the rest in training centers, vocational institutes, community colleges, and rehabilitation agencies. The 42 computer-based information delivery systems are listed alphabetically by state with information on management, organizations represented on advisory body, special features, delivery system medium and statistics, service statistics, and finances. Eleven descriptions of major software systems are given including the Appalachia Educational Laboratory Career Information System, Career Information System, Career Prospects, CHOICES, Coordinated Occupational Information Network/Bell & Howell, National Educational Software Service, DISCOVER, Guidance Information System, Micro-SKILLS, System of Interactive Guidance and Information, and VIEW. A description of ACSCI and technical notes are given. Full and supporting members of ACSCI are listed. (ABL)

ED266392
Evaluations of Computer-Based Career Information Delivery Systems: An Annotated Bibliography.
Association of Computer-Based Systems for Career Information, Eugene, OR, Clearinghouse.
1985; 47p. For related documents, see ED 266 389-391.
EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.
Document Type: Reference Materials—Bibliographies (131)
Major Descriptors: *Career Counseling; *Career Guidance; *Computer Oriented Programs; *Delivery Systems; *Information Systems

This document contains an annotated bibliography which includes citations for 73 reports or other documents that deal with the evaluation of computer-based career information delivery systems. A few entries deal with the broader field of computer-assisted career guidance. The citations are grouped under three headings: (1) 42 state-based systems, listed alphabetically by state; (2) 8 comparisons of systems, listed alphabetically by author; and (3) 23 other documents, listed alphabetically by author. Coding at the end of each entry identifies the topics discussed in that document. (NRB)

ED266389
Handbook of Standards for Computer-Based Career Information Systems.
Association of Computer-Based Systems for Career Information, Eugene, OR, Clearinghouse.
1982; 26p. For related documents, see ED 266 390-392.
EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.
Document Type: Guides—General (050)
Target Audience: Administrators; Counselors; Practitioners
Major Descriptors: *Career Counseling; *Computer Oriented Programs; *Counseling Effectiveness; *Educational Counseling; *Information Systems; *Standards

This document presents standards for computer-based career information systems developed by the Association of Computer-Based Systems for Career Information (ACSCI). The adoption of ACSCI standards constitutes a voluntary means for organizations to declare that they subscribe to certain quality measures. These standards can be used to: (1) foster excellence through the development of criteria and guidelines for assessing effectiveness; (2) encourage improvement of effectiveness through self-study; (3) assure the users and the public that members have well-defined and appropriate objectives and criteria by which to be judged, and an organization to meet these standards; (4) provide assistance to developing systems; and (5) protect systems against factors harmful to effectiveness. A total of 51 standards are listed and briefly discussed in the six categories of organization, information development, marketing and user services, delivery systems, evaluation, and system finance. Each standard is numbered. A yes/no membership checklist of questions for organizations seeking eligibility in ACSCI is given and purposes and membership benefits of the association are listed. (ABL)

Management/Planning

ED265225
A Taxonomy of Questions, or, What the Computer Can Help You Learn about Your Students' Achievement, Attendance, Characteristics. Management of Instructional Information Systems Project.
Bank, Adrianne; Williams, Richard C.
California Univ., Los Angeles. Center for the Study of Evaluation.
Sponsoring Agency: National Inst. of Education (ED), Washington, DC.
1985; 62p.
EDRS Price—MF01/PC03 Plus Postage.
Document Type: Reports—Descriptive (141); Reference Materials—Vocabularies/Classifications (134)
Major Descriptors: *Classification; *Computer Oriented Programs; *Educational Assessment; *Information Systems; *Questioning Techniques

This document is divided into two parts: the first presents a taxonomy of questions designed for a hypothetical computer database; the second describes the rationale for a question oriented approach to data. This taxonomy is described as a list of questions an educator might use to find out more about the achievement, attendance, and characteristics of individual students, groups of students, or schools. Three sets of data are selected to represent the types of data generally available in schools, including student test scores, student attendance records and student characteristics. Examples of specific questions to ask of the database are given. The Management of Instructional Information Systems project at the Center for the Study of Evaluation (University of California at Los Angeles) describes the question-asking approach which means delineating those questions that are in need of answers. The taxonomy of questions is presented as it might be used by various members of the school community to develop

information about students, classes, grades, special groups, or schools. The future of taxonomies of questions and their relation to the emergence of instructional information systems is discussed. (LMO)

ED271847
The Role of Technology in School Improvement. A Presenter's Guide. Research Based Training for School Administrators.
Carnine, Doug; And Others
Oregon Univ., Eugene. Center for Educational Policy and Management.
Sponsoring Agency: American Association of School Administrators, Ariington, Va.
1984; 164p. A product of the Research-Based Training for School Administrators Project.
EDRS Price—MF01/PC07 Plus Postage.
Document Type: Guides—Non-classroom (055); Information Analyses—General (070)
Target Audience: Administrators; Practitioners
Major Descriptors: *Computer Assisted Instruction; *Computer Oriented Programs; *Computer Uses in Education; *Information Processing; *Programing Languages; *Videodisks

This workshop presenter's guide is intended for use by administrators in training one another in the Project Leadership program developed by the Association of California School Administrators (ACSA). This manual is divided into four areas of technology and education: (1) Administrators and Computers, (2) Computer-Assisted Instruction (CAI), (3) Videodisk Instruction, and (4) Programming Languages. After an introduction, chapter 2 discusses hardware and software and how they are used in schools; common programs for administrators (word processing, electronic spreadsheets, and integrated packages); special administrative application programs (attendance, scheduling, and Individualized Education Plan (IEP) management); and information processing (grade book programs, automated scoring and diagnostic analysis, and group CAI). Chapter 3 discusses the topics of drill and practice, tutorial and simulation-oriented computer-assisted instruction, instructional games, and word processing. Chapter 4 discusses instructional design, mastery learning procedures, and benefits to administrators. Chapter 5 discusses programming languages (Basic, Pascal, and Logo). The guide contains masters of 30 numbered transparencies, participants' work sheets, 4 handouts that provide workshop summaries and bibliographic references, and a 25-item reference list of sources cited or referred to in the text. (IW)

ED270088
District Computer Concerns: Checklist for Monitoring Instructional Use of Computers.
Coe, Merilyn
Northwest Regional Educational Lab., Portland, Oreg.
Sponsoring Agency: National Inst. of Education (ED), Washington, DC.
1985; 14p.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Guides—Non-classroom (055); Tests/Questionnaires (160)
Target Audience: Practitioners; Policymakers
Major Descriptors: *Computer Assisted Instruction; *Computer Uses in Education; *Evaluation Methods; *Microcomputers; *Program Evaluation

Designed to assist those involved with planning, organizing, and implementing computer use in schools, this checklist can be applied to: (1) assess the present state of instructional computer use in the district; (2) assist with the development of plans or guidelines for computer use; (3) support a start-up phase; and (4) monitor the implementation or progress of an on-going program. Based on the need for coherency, rationality, and coordination between buildings and districts, the guidelines are designed from the district point of view. The main areas of assessment include: methods of computer use (computer assisted instruction, software application, programming); hardware and software currently in use; funding sources; computer brands being utilized; availability and types of teacher inservice training; equity in computer access; district computer planning activities and guidelines; and problems and impediments to successful computer implementation and development. (JB)

ED265616
Minimum Computer Knowledge for Elementary Principals.
Coffin, Gregory C.
1985; 16p. Paper presented at the Annual Meeting of the New Hampshire Association of School Principals/Joint Educational Council Conference (Manchester, NH, October 17-18, 1985).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Speeches/Meeting Papers (150); Opinion Papers (120); Guides—Non-classroom (055)
Target Audience: Administrators; Practitioners
Major Descriptors: *Administrator Role; *Computer Literacy; *Microcomputers; *Principals

The continuing growth of computer understanding and use by educators makes it imperative for elementary school principals to become computer literate. Teachers' knowledge and skills relating to computers are increasing; computer costs are declining and computers becoming more readily available; software is improving in response to demand; and the microcomputer is making its presence felt as an effective teaching tool. To be able to respond to the school's increasing use of and need to use computers, principals must have a basic working understanding of both the school's computer hardware and the software that is available for that hardware. The principal should be able to assess such factors as hardware costs, capacities, and uses, and software's availability, compatibility with hardware, quality, and relevance to educational or administrative goals. Principals should read at least one computer education journal regularly to keep up on developments in the field. With computer literacy, principals can increase their control of budgeting, office administration, and instructional leadership. (PGD)

ED260561
How School Systems Should Purchase Microcomputers: The Software Evaluation Method.
Evans, Robert J.
[1985]; 25p.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Guides—Non-classroom (055)
Target Audience: Practitioners
Major Descriptors: *Courseware; *Microcomputers; *Program Development

The paper addresses three major concerns associated with incorporating microcomputers into educational settings: computer use, software selection, and hardware selection. Advantages of the computer in instructional settings are noted as well as its limitations. Staff is advised to select which of four applications is appropriate to their setting (the microcomputer as an object to be studied, as tool to help in one's work, as a teacher or tutor, and as a management tool). Software evaluation is considered in terms of external and internal evaluations. Practical aspects of hardware evaluation are offered, including costs and compatability. Five steps are outlined in the summary: (1) curricula needs must be identified; (2) a "goodness of fit" between identified needs and computer uses must be determined; (3) software which meets curricula needs must be identified; (4) identified software must be thoroughly evaluated; and (5) the application of basic consumer considerations should be used to purchase microcomputers and peripherals which will adequately run the selected software. A sample software evaluation form and a five-page reference list are appended. (CL)

ED265846
Computers in the Gym: Friends and Assistants.
Hurwitz, Dick
[1985]; 21p. Paper presented at the Annual Educational Computer Fair of the Educational Computer Consortium of Ohio (5th, Cleveland, OH, October 10-11, 1985).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Opinion Papers (120); Reports—Descriptive (141); Speeches/Meeting Papers (150)
Target Audience: Practitioners
Major Descriptors: *Computer Software; *Microcomputers; *Physical Education; *Physical Education Teachers

Designed to assist physical education teachers realize the benefits of microcomputer usage, this paper presents the case study of a hypothetical middle school teacher who utilizes Apple computers for record-keeping, planning, teaching, and coaching. The case study shows how the computers save time, assist in individualizing instruction, help motivate and interest students, and allow the teacher to communicate with others in her field. In addition, several computer programs and their applications are discussed: (1) Appleworks; (2) Teacher Utilities, Volume 1; (3) Sports Data Services Volleyball Statistics; (4) Petwork (a hypothetical communications network); (5) Project REACT Athletic Scheduling; (6) Attendance Taker; (7) The Factory; (8) Project REACT Bowling; (9) Physical Education Record Keeper; (10) Body Fat Calculator; and (11) Comptech Systems Design Volleyball. A list of references is appended which provides sources for the computer software mentioned in the docume. (JB)

ED267785
Memphis State Regression Computer-Managed Instruction Model.
Morrison, Gary R.; Ross, Steven M.
1986; 12p. Paper presented at the Annual Convention of the Association for Educational Communications and Technology (Las Vegas, NV, January 16-21, 1986). For entire proceedings, see ED 267 753.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Target Audience: Researchers
Major Descriptors: *Computer Assisted Instruction; *Individualized Instruction; *Individual Needs; *Microcomputers; *Models

While individualized learning strategies typically provide large amounts of instructional support, they also reply heavily on learner judgement to determine the amount of support required to achieve an objective. Frequently, these strategies result in high achievers selecting too much support and low achievers selecting too little. Interest in this problem led to the development of the Memphis State Regression Model, which systematically selects the amount of instructional support the learner needs. Three adaptive versions of the model were evaluated: (1) quantity of instructional support and incentives; (2) meaningfulness of problem-solving contexts; and (3) density of narrative text. The first study consisted of five treatment groups: individual prescriptions generated by the model, prescriptions based on ability, low or high levels of instructional support, and nonadaptively-varied instructional support. Results indicated that the adaptive group performed significantly better than any of the other treatments. The second model was evaluated via three studies which adapted problem contexts to the learner's interest. Results indicated that the context-specific groups performed significantly better in all three studies. The third study focused on the application of this model in a self-instructional unit covering 10 algebraic rules taught in an introductory college statistics course. Three versions of instruction were developed and administered to students via print or computer presentation—low, high, or learner control of narrative density. Learners in the computer model took more time with both the high- and low-density treatments; subjects in the computer mode of the learner controlled treatment also selected the high-density narrative more often, suggesting that they had less confidence when learning from information presented via a CRT screen. A list of references and a flow chart of the model are provided. (JB)

ED268661
Administrative Uses of Computers in the Elementary Schools.
Rolley, Martha
1986; 9p. Paper presented at the Annual Meeting of the National Catholic Educational Association (Anaheim, CA, March 31-April 3, 1986).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Speeches/Meeting Papers (150); Guides—Non-classroom (055)
Target Audience: Administrators; Practitioners
Major Descriptors: *Administrators; *Computer Oriented Programs; *Information Utilization; *Microcomputers; *School Effectiveness

Frequently administrators must spend time producing documents and reports, though theoretically they are supposed to use information to create better educational environments and experiences for students. By using the personal computer as a tool for tasks and analyses that, before the computer, used to take days, administrators will have time to utilize their higher order thinking skills—evaluation, conclusion, and application. The specific administrative areas that a computer can handle better than a person include ordinary typing tasks, student and personnel information processing, and financial recording and planning. Word processing programs and database programs will expedite these tasks. Listed are 10 programs, primarily ones that run on the Apple IIe or Apple IIc systems, and the sample tasks shown as part of the presentation. (MLF)

Networking

ED272190
Linking Microcomputers to Share Educational Data. Evaluation Guides. Guide Number 21.
Deck, Dennis; Coe, Merilyn
Northwest Regional Educational Lab., Portland, Oreg.
Sponsoring Agency: National Inst. of Education (ED), Washington, DC.
[1985]; 25p. A product of the Research on Evaluation Program.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Evaluative (142)
Target Audience: Researchers
Major Descriptors: *Computer Uses in Education; *Information Networks; *Microcomputers; *Telecommunications

Designed for educational evaluators, this paper discusses reasons for the growing concern with linking or interfacing computers for information sharing; compares three major approaches to linking; and discusses the implications of each. An initial overview presents three linking applications in educational evaluation: (1) linking microcomputers with mainframes for data analysis; (2) data collection; and (3) distribution of instructional information systems. Scenarios are also provided which illustrate each of the three applications. The three major technical approaches to linking microcomputers with mainframes or each other are then described—exchanging electronic media (floppy disk exchange); telecommunications linkages, including asynchronous and synchronous connections; and linking products (software packages). Examples and implications of each approach are discussed, including their advantages and disadvantages. Alternatives to shared access to a large database, such as local area networks and multi-

user microcomputers, are also described, and their advantages and disadvantages outlined. Finally, the problems of coordination and system design are addressed; it is noted that finding solutions to linking problems takes time and experimentation, and that computer resources cannot be maximized without user acceptance. The latter necessitates the involvement of users in each stage of the planning, design, and testing of the application. Six examples of evaluation linking applications that are being implemented conclude the document, and a list of references is provided. (JB)

ED264848
The Feasibility of Computer Networking in Education. A Study Submitted to the Thirteenth Session of the Alaska State Legislature.
Alaska State Dept. of Education, Juneau. Office of Educational Technology and Telecommunications.
1983; 118p. For the proceedings of the Annual Alaska Small Schools Conference (4th, Anchorage, AK, December 3-5, 1984), see ED 257 600.
EDRS Price—MF01/PC05 Plus Postage.
Document Type: Reports—Evaluative (142)
Target Audience: Policymakers
Major Descriptors: *Information Networks; *Microcomputers; *State Surveys; *Telecommunications

A 4-month study was conducted to determine the feasibility and desirability of computer networks for instruction and educational administration in Alaska. Five major activities were carried out to collect the necessary information: (1) interviews with representatives of other Alaska government agencies; (2) a survey of district office staff; (3) a survey of a large sample of Alaska educators; (4) a meeting with representatives from state agencies and local districts; and (5) a review of technical information. Technical information gathered suggests that the hardware and software necessary to implement computer networking in Alaska education are, for the most part, currently available. Also, surveys and discussion with Alaska educators suggest they believe the quality of education in their localities could be enhanced by improved communications resulting from computer networking efforts. However, many educators were reluctant to expend limited local resources for electronic communications simply to enhance the timeliness of the information being sent, and ranked networking activities as less critical than several other educational computer areas. It was concluded that the Department of Education should conduct activities to investigate implementation of educational networks, but that this should not preclude providing support in other areas of educational technology. Appendices include copies of technical materials from the 1982 and 1983 Annual Alaska Small Schools Conferences. (JB)

ED260709
Guidelines for Selection of Electronic Networking Software and Hardware.
Rieck, Donald A.
1985; 11p. Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, March 31-April 4, 1985).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Guides—General (050); Speeches/Meeting Papers (150)
Target Audience: Researchers
Major Descriptors: *Computers; *Computer Software; *Information Networks; *Information Services; *Online Systems

This article discusses the issues that confront network users and systems operators when they explore and adapt their professional communications activities to electronic communication. (Electronic networking here refers to the use of the telephone and the computer to facilitate communication between or among professional groups in a variety of locations.) Networking is categorized into several functioning levels or types: level one—single user(s) and "host" system; level two—multiuser or local area network system; and level three—multinetwork system. Each level is defined in terms of equipment and personnel needed, and limitations of each system are noted. This article is specifically concerned with guidelines for level one, although some questions and guidelines are given for the other levels. Six major areas of concern relative to electronic networks and their selection are listed and discussed in terms of level one users: (1) define systems usage; (2) define where technical support and service will come from; (3) define how much funding is available and/or how much can be justified; (4) describe how "user-friendly" and adaptable the system must be; (5) determine the technical, physical scope of the network; and (6) determine the kinds of software capabilities that will be needed. Four priorities are listed for software needs: a communications package for hardware, a "starter kit" for some online network database, a software protocol and communications package for establishing one's own local network system, and specialized software to expand the local network. (JB)

Research

ED260693
A Multimedia Knowledge Representation for an "Intelligent" Computerized Tutor. Technical Report No. 142.
Baggett, Patricia; Ehrenfeucht, Andrzej
Colorado Univ., Boulder. Inst. of Cognitive Science.

Sponsoring Agency: Office of Naval Research, Arlington, Va. Personnel and Training Research Programs Office.
1985; 52p.
EDRS Price—MF01/PC03 Plus Postage.
Document Type: Reports—Research (143)
Target Audience: Researchers
Major Descriptors: *Artificial Intelligence; *Computer Assisted Instruction; *Multimedia Instruction; *Repair; *Tutoring

The intended end product of the research project described is an "intelligent" multimedia tutoring system for procedural tasks, in particular, the repair of physical objects. This paper presents the data structure that will be used, i.e., a graph with five types of nodes (mental, abstract, motoric or action, visual, and verbal) and two types of links (subconcept and pointer). The graph examples given in the paper are knowledge representations of conceptualizations that people might have for a simple object, e.g., a flashlight. Use of the representations is shown for choosing actions, planning strategies, making inferences, and designing instructions. The plan for computer implementation of the tutoring system is also given, as well as a report on applications of this knowledge representation, including how it can be derived from experimentally observed behavior. Finally, this knowledge representation is compared with others such as KRL, Pavio, and linguistically based theories. (Author/JB)

ED267758
External Pacing as an Instructional Strategy for the Design of Micro-Computer Based Instructional Programs to Improve Performance on Higher Level Instructional Objectives.
Canelos, James; And Others
1985; 20p. Paper presented at the Annual Convention of the Association for Educational Communications and Technology (Las Vegas, NV, January 16-21, 1986). For entire proceedings, see ED 267 753; for a related paper, see ED 256 310.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Target Audience: Researchers
Major Descriptors: *Computer Assisted Instruction; *Conceptual Tempo; *Instructional Design; *Intermode Differences; *Microcomputers; *Pacing

Research was conducted to further investigate the results of an earlier 1985 study (Dwyer, et al.) which found that a moderately externally-paced microcomputer-based instructional program was more effective than either a self-paced or a more aggressive externally-paced condition. Instructional programs (heart parts and verbal labels) were identical to the earlier study; the only overall change was the addition of a 5-second delay after presentation of a visual in which no verbal instructions were presented. Two of the instructional conditions provided an imaging cue which occurred with every five to seven instructional displays in the sequence of 57 displays. Two hundred subjects (freshmen from Ohio State University) were randomly assigned to four instructional conditions, and then randomly assigned to the imagery training and no training groups within their instructional condition. Analysis of variance was conducted on data collected from 168 subjects. Results indicate the visual delay forced the subject to concentrate on the visual display of the heart and labels, thus improving overall information processing. This information supports the hypothesis that putting the learner in complete control of instruction may not be the best teaching method for computer-based instruction. Additionally, the existence of an external control, i.e., a cue to form images, may provide students with needed support. Seven data tables, two figures, and a list of references are provided. (JB)

ED268989
Cognitive Education and Native Adolescents: A Pilot Study.
Carnew, Frederick I.; Clark, W. Bruce
Calgary Univ. (Alberta). Inst. for Computer Assisted Learning.
1985; 158p.
EDRS Price—MF01/PC07 Plus Postage.
Document Type: Reports—Research (143); Tests/Questionnaires (160)
Target Audience: Researchers
Major Descriptors: *Academic Achievement; *Adolescents; *American Indian Education; *Cognitive Development; *Computer Assisted Instruction; *Underachievement

This study investigated the potential usefulness of a cognitive education intervention approach to improving learning abilities of underachieving Native adolescents. The specific variables considered were: (1) the manner in which this approach may affect cognitive development; (2) academic learning; (3) attitudes towards and interest in academic subjects; and (4) teacher attitudes towards such students. Subjects included 56 Native Cree Indian adolescents who were assigned to experimental (N=38) and control (N=18) groups based on their need for remedial or regular instruction respectively. Pretests were administered to identify underdeveloped cognitive functions and computer literacy was assessed via a computer awareness questionnaire. The experimental group received the intervention program, which comprised an introductory LOGO computer language component; an extended computer component; and reading, writing, and mathematics components. Posttests were then administered to both groups and an analysis

of variance was conducted to determine the significance of any differences between the experimental and control groups. Results indicated that involvement in the intervention program did positively affect the experimental subjects' cognitive functioning abilities and improve their achievement in reading and writing; however, teaching for transfer of cognitive functions neither affected the students' attitudes toward academic subjects nor improved their achievement in mathematics. An extensive bibliography is provided, and copies of the computer awareness questionnaire, parent permission slips, and tables of contents for the program components are appended. (JB)

ED269427
Initial Skill Learning: An Analysis of How Elaborations Facilitate the Three Components.
Charney, Davida H.; Reder, I ynne M.
Carnegie-Mellon Univ., Pittsburgh, Pa. Dept. of Psychology.
Sponsoring Agency: National Science Foundation, Washington, D.C.; Office of Naval Research, Arlington, Va. Personnel and Training Research Programs Office.
1986; 56p.
EDRS Price—MF01/PC03 Plus Postage.
Document Type: Reports—Research (143)
Major Descriptors: *Cognitive Development; *Computer Software; *Learning Processes; *Learning Strategies; *Learning Theories; *Skill Development

This paper outlines the components of initial cognitive skill acquisition and analyzes features of elaborations in the instructional materials that can facilitate each component. Three basic components of skill learning are identified: (1) learning novel concepts and the functionality of novel concepts and procedures; (2) learning how to execute the procedures; and (3) learning the conditions under which the procedures can and should be applied. Three types of elaborations are analyzed in terms of the requirements of these components: analogies, simple instantiations, and situation examples. Situation examples are held to be the most useful type of elaboration for skill learning because each example can contribute to learning in all three components. On the other hand, while analogies can be constructed to illustrate each component, they are more likely to help people learn the functionality of a procedure than how to execute it or when to select it. However, since learners tend to rely on examples as models, it is important to choose examples with care and to provide enough examples to illustrate the range of application of a rule or procedure. Otherwise, learners may interpret a rule incorrectly or make spurious assumptions about the conditions under which it applies. (Author/PN)

ED263876
Computer Research Confounding.
Clark, Richard E.; Leonard, Stuart
Sponsoring Agency: University of Southern California, Los Angeles.
1985; 27p. Paper presented at the Annual Meeting of the American Educational Research Association (69th, Chicago, IL, March 31-April 4, 1985). Research made possible by a grant from the EDUCARE Faculty Research Projects Committee of the University of Southern California.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Target Audience: Researchers
Major Descriptors: *Academic Achievement; *Computer Assisted Instruction; *Research Needs; *Research Problems; *Validity

The suspected sources of confounding in current meta-analytic studies of computer based instruction (CBI) are uncontrolled effects of instructional method and/or the John Henry Effect (i.e., compensatory rivalry). To determine which confounding is most plausible, a random 30% sample of the 128 studies which formed the original Kulik meta-analyses for primary, secondary, and college levels was selected for a descriptive review. Evidence from reviewer coding of study features strongly suggests that the achievement gains found in CBI studies are actually due to the uncontrolled but robust instructional methods employed in these treatments. Cautions are offered for those who wish to implement CBI in schools and for research design, and it is suggested that the achievement gains attributed to the computer mode of delivery are probably due instead to the instructional methods employed in their software, and these methods could probably be delivered by a teacher. A list of references and appendices with data tables complete the documents. (Author/JB)

ED267762
The Effects of Video-Only, CAI Only, and Interactive Video Instructional Systems on Learner Performance and Attitude: An Exploratory Study.
Dalton, David W.; Hannafin, Michael J.
1986; 13p. Paper presented at the Annual Convention of the Association for Educational Communications and Technology (Las Vegas, NV, January 16-21, 1986). For entire proceedings, see ED 267 753.

EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Target Audience: Researchers
Major Descriptors: *Attitude Measures; *Computer Assisted Instruction; *Intermode Differences; *Student Attitudes; *Videotape Recordings

This study compared the effects of interactive video instruction on learner performance and attitude with the effects of conventional computer assisted instruction (CAI) and stand-alone video. Based on pretest scores, 134 junior high industrial arts students designated as relatively high or low in prior achievement were randomly assigned to one of the three treatment groups. At the conclusion of a lesson on general shop safety rules, students were given a print-based posttest and a survey to assess their attitudes toward the instruction. Analysis consisted of a completely crossed 3X2X2 treatment by achievement by sex factorial design, featuring three levels of prior achievement (high, average, and low). The means for the treatment groups on the performance measure were 64.98%, 73.54%, and 70.48% for the video, CAI, and interactive video treatments respectively; attitude scale means measured 75.07%, 74.26%, and 82.87%. Results indicate that CAI alone tends to be the most effective instructional delivery system where the additional capabilities provided by interactive video are not required. However, interactive video instruction did produce significant improvements in the attitudes of low ability learners when compared with CAI and video. A list of references is provided. (JB)

ED271110
Technology Transfer of a Reading Skill Improvement Program for the National Commission on Libraries and Information Science (NCLIS). Technology Transfer Report.
Duffy, Thomas; And Others
Army Human Engineering Lab., Aberdeen, MD.
1985; 130p.
EDRS Price—MF01/PC06 Plus Postage.
Document Type: Reports—Research (143); Tests/Questionnaires (160)
Target Audience: Policymakers
Major Descriptors: *Adult Basic Education; *Computer Assisted Instruction; *Literacy Education; *Microcomputers; *Reading Skills; *Technology Transfer

A program referred to as Language Skills Computer Assisted Instruction (LaSCAI) was chosen to assist volunteer tutors in improving the reading skills of adults. The program was demonstrated at two libraries—one rural and one urban—and an evaluation was completed to determine its applicability in enhancing the on-going tutoring programs at these sites. Prior evaluations had shown that LaSCAI does improve functional reading ability, so the main focus of the library demonstrations was to determine the value that the tutors and students placed on the LaSCAI program. The qualitative evaluations consisted of pre- and post-interviews with students and tutors to reveal their attitudes toward literacy, tutoring, computers, and the LaSCAI program in general. Results of this evaluation indicate that the program should be very successful when integrated properly into the adult literacy programs in current use in libraries. Specific conclusions are: (1) the LaSCAI program can be used to advantage in a library setting using microcomputers and volunteer tutors to raise the reading level and increase the literacy retention of adult students; (2) a certain amount of program modification, revision, and documentation is still required to extend this program to other libraries without extensive personnel support; and (3) a single source is needed to administer the application of this program for other libraries, to serve as a clearinghouse for subject matter prepared on disks, and to obtain resources and direct continuing research and development needed to improve and expand the use of the program. (Author/THC)

ED267773
The Effects of Presentation Latency and Embedded Orienting Strategies on Learning from Computer-Based Instruction.
Hannafin, Michael; And Others
1986; 22p. Paper presented at the Annual Convention of the Association for Educational Communications and Technology (Las Vegas, NV, January 16-21, 1986). For entire proceedings, see ED 267 753.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Target Audience: Researchers
Major Descriptors: *Computer Assisted Instruction; *Intermode Differences; *Learning Strategies; *Prompting; *Time Factors Learning

The purpose of this study was to examine the effects of behavioral and cognitive organizing strategies and varied processing intervals on factual and inferential learning. A total of 49 upper-division undergraduate and graduate students, who were randomly assigned to either a cognitive, behavioral, or individual orienting strategy group, received computer-assisted instruction (CAI) with either 10 or 30 seconds of access time to branch to lesson segments. Presented at identical locations throughout the lesson, orienting strategies addressed criterion information either explicitly

or in more general abstract terms. Upon completion of the lesson, students were administered a posttest measuring both factual and inferential learning. Results indicate that the explicitness of the orienting strategy did not affect the learning of either facts or inferences differentially; however, a marginal effect was found for access time, with students performing better with 30 seconds. The results suggest that differences in orienting strategies may not be as important as sufficient time for strategy utilization. A list of references, two data tables, and two figures are included. (Author/JB)

ED262754
Research on the Effectiveness of Computer-Based Instruction: A Review. Technical Report No. 84.1.3.
Hasselbring, Ted
George Peabody Coll. for Teachers, Nashville, TN. Learning Technology Center.
1984; 20p.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Information Analyses—General (070)
Target Audience: Researchers
Major Descriptors: *Academic Achievement; *Computer Assisted Instruction; *Instructional Material Evaluation; *Microcomputers

This paper contains summaries of the findings of research and meta analyses conducted on the effectiveness of computer-based instruction (CBI) on student achievement. Eight conclusions, based on the CBI research are then given: (1) when CBI and traditional instruction are compared, students receiving CBI demonstrate equal or better achievement; (2) equal or better achievement using CBI is obtained in less time; (3) the use of CBI improves student attitudes towards the use of computers in learning situations; (4) the positive effect on learning achievement occurs regardless of the type of CBI used, the type of computer system, or the age of the students; (5) teacher interaction proves to be effective in CBI situations; (6) there is little evidence to support the claim that learning to program will result in higher level cognitive skills and capabilities to learn; (7) tutorial and drill modes seem to be more effective for low-ability students than for middle- or high-ability students; and (8) the effect on learning achievement seems to be greatest for pre-college age learners. Research findings are also presented for social development factors and the cost effectiveness of CBI, and a summary statement and 27-item bibliography conclude the document. (JB)

ED262912
Identification of Restrictive Computer and Software Variables among Preoperational Users of a Computer Learning Center.
Kozubal, Diane K.
1985; 67p. Ed.D. Practicum, Nova University.
EDRS Price—MF01/PC03 Plus Postage.
Document Type: Dissertations/Theses—Practicum Papers (043); Reports—Research (143)
Major Descriptors: *Computer Software; *Coordination; *Design Requirements; *Kindergarten Children; *Student Behavior

While manufacturers have produced a wide variety of software said to be easy for even the youngest child to use, there are conflicting perspectives on computer issues such as ease of use, influence on meeting educational objectives, effects on procedural learning, and rationale for use with young children. Addressing these concerns, this practicum aimed to identify restrictive computer and software variables which increase the need for adult assistance, fail to complement the young child's mental schema, or limit spontaneous interaction. Data were collected on the availability of computer experiences away from school, use at home, and parental attitudes toward the inclusion of computers in an early childhood curriculum. Kindergarten children were observed at a computer learning center during a regularly scheduled free choice activity period. Observational data were collected on grouping characteristics, time on task, software operations, user interactions, sensory response manipulations, requests for assistance, and restrictive variables. The practicum revealed a need to coordinate contemporary philosophies of education with professional censure and the technological expertise of programmers, and to develop modified programs for young children which incorporate picture menus, consistent keyboard formats, uncluttered screens, error accounting, and contemporary letter/numeral configurations. (Author/RH)

ED260792
A Study of the Possibilities for Reversible Actions in Software for Young Children.
Kuschner, David
1985; 24p. This study was partially funded by a faculty research grant from the Office of Research and Program Development, University of North Dakota.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Major Descriptors: *Computer Software; *Educational Media; *Instructional Materials; *Kindergarten Children; *Logic

A study was made of the extent and ways different types of educational software allow young children to manipulate

their own actions and, more specifically, to engage in reversible activity. Part 1 of the study consisted of an analysis of the types of reversible actions two kindergarten children engaged in and the actions they wanted to engage in but could not because of the nature of the software program they used. Part 2 of the study consisted of an analysis of a number of software programs designed to be of educational value for children between the ages of 5 and 8 years in which the basic activity is the construction or creation of pictures on the monitor screen. Programs analyzed were Grandmas' House, Kids at Work, Kidwriter, Pic.Builder, Rainbow Painter, Stickers, Story Maker, and StoryMaker. Analysis focused on the transformational activity related to the development of mental reversibility: negation; modifying of objects and their positions, movements, and arrangements; and the placing of objects into relationships through combining, separating and rearranging parts and wholes. After a brief review of the Piagetian concept of reversibility, results are discussed. Concluding remarks focus on characteristics of optimal "constructive" educational software. (RH)

ED262006
The Role of Teacher Incentives and Rewards in Implementing a Technological Innovation. Final Report.
Loucks-Horsley, Susan; And Others
Bolt, Beranek and Newman, Inc., Cambridge, Mass.; NETWORK, Inc., Andover, MA.
Sponsoring Agency: National Inst. of Education (ED), Washington, DC.
1985; 221p.
EDRS Price—MF01/PC09 Plus Postage.
Document Type: Reports—Research (143)
Major Descriptors: *Educational Innovation; *Incentives; *Program Implementation; *Teacher Motivation

A study was made of the implementation and institutionalization of the "Quill" system, a set of microcomputer-based writing activities for upper elementary school students. The purpose of the study was to gain insight into the roles played by incentives and rewards as teachers attempt to improve their practice with a new innovation. Ten classroom teachers participated. School sites were highly diverse. Through documentation of teachers' use of "Quill," it was determined what incentives and rewards were offered to, and experienced by, the teachers, and how these interacted with the characteristics of the support sytem, school, classroom, and students to influence the implementation of "Quill" and its success as an innovation. This final report documents the background of the study, the research design, findings, and cross-case analyses. Detailed case study reports are presented along with analyses of teachers' implementation of "Quill." "Quill" vignettes are included. Rewards to teachers for putting effort into the innovation depended upon the success of the effort and the teacher's ultimate interest in the innovation. Such rewards were intrinsic, e.g., satisfaction with student progress and a sense of importance derived from involvement with the project. (JD)

ED260692
Locus of Control among Computer-Using School Children. A Report of a Pilot Study.
Louie, Steven
National Advisory Council for Computer Implementation in Schools, Tucson, AZ.
1985; 36p.
EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.
Document Type: Reports—Research (143)
Target Audience: Researchers
Major Descriptors: *Computer Assisted Instruction; *Locus of Control; *Microcomputers; *Self Concept

A convenience sample of 46 subjects was selected from 104 elementary through secondary self-selected students who participated in a prototypical voluntary after-school and summer computer camp operated by an American southwestern nonprofit educational research laboratory. Following an initial 16-hour exposure to LOGO and Bank Street Writer, a minimal shift toward an internal locus of control was found for children 12 years of age or less (paired 1-tailed t-test significant at .03), as measured pre- and post-test with the Nowicki-Strickland Locus of Control (LOC) Scale for Children. The LOC scale was chosen as an operationalization of Seymour Papert's concept of "empowering children" via microcomputer interaction. Because prior research on LOC has associated an internal LOC with positive learner attributes, it was felt that such an investigation could assist researchers in more clearly distinguishing between the reaction of different groups toward technology as a tool. Study findings include data which indicate that the study group did demonstrate a significant shift towards internality, "planning" seems to be poorly regarded by even the most "internal" of students, and the subject's self-acceptance experienced a negative shift from pre- to post-tests. (Author/JB)

ED267753
Proceedings of Selected Research Paper Presentations at the 1986 Convention of the Association for Educational Communications and Technology and Sponsored by the Research and Theory Division (Las Vegas, NV, January 16-21, 1986).
Simonson, Michael R., Ed.; And Others
Association for Educational Communications and Technology, Washington, D.C.
1986; 848p. For individual papers, see ED 267 754-800. For an earlier proceedings, see ED 256 301.

EDRS Price—MF05/PC34 Plus Postage.
Document Type: Collected Works—Proceedings (021); Opinion Papers (120); Reports—Research (143)
Target Audience: Researchers
Major Descriptors: *Cognitive Processes; *Computer Assisted Instruction; *Educational Technology; *Instructional Design; *Media Research; *Microcomputers

Current issues in educational communications and technology are addressed in this collection of 47 papers, in which research reports dominate. Topics discussed include factors related to the learner, e.g., problem-solving skills, motivation, comparison of instructional design strategies, effects of organizational cues and text layouts, and learning strategies. Several papers examine innovative educational media such as interactive video, electronic mail, teletraining, computer-assisted instruction, computer-generated text, simulations, and microcomputers. Additional papers discuss the use of cable television in higher education, noncommercial FM radio stations, instructional television services, use of bulletin boards and electronic mail in distance education, evaluation of media support services, user attitudes toward computers, and effects of Logo instruction. References and data tables are included with many papers. Cumulative indexes of authors and descriptors covering the first eight volumes of conference proceedings (1979-1986) for the Research and Theory Division of the Association for Educational Communications and Technology are included. (JB)

ED269442
Microcomputer Programs for Educational Statistics: A Review of Popular Programs. TME Report 89.
Stemmer, Paul M.; Berger, Carl F.
ERIC Clearinghouse on Tests, Measurement, and Evaluation, Princeton, N.J.
Sponsoring Agency: Office of Educational Research and Improvement (ED), Washington, DC.
1985; 48p.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Reports—Evaluative (142); Information Analyses—ERIC IAP's (071)
Major Descriptors: *Computer Software; *Evaluation Criteria; *Media Selection; *Microcomputers; *Statistical Analysis

This publication acquaints the user with microcomputer statistical packages and offers a method for evaluation based on a set of criteria that can be adapted to the needs of the user. Several popular packages, typical of those available, are reviewed in detail: (1) Abstat, an easy to use command driven package compatible with the IBM PC or the Apple II, can translate raw scores to z-scores; (2) Apple Interactive Data Analysis (AIDA) allows users to alter or program their own routines, using BASIC; (3) CRunch Interactive Statistical Package (CRISP), a menu-driven package for the IBM PC, has clear documentation; (4) Microstat, a menu-driven package for the IBM PC, is very easy to use; (5) Statistical Processing System (SPS), a menu-driven program, tends to have statistics favoring the natural sciences; and (6) Statistical Package for the Social/Sciences/Personal Computer Version (SPSS/PC) has retained the most important routines of the original SPSS. Examples of the basic command structure of statistics packages are offered in Appendix A. Appendix B, a compendium of microcomputer statistical resources, lists but does not evaluate important features of approximately one hundred programs. (GDC)

ED265367
A Research Study to Determine the Effects of Early Keyboard Use upon Student Development in Occupational Keyboarding. Final Report of Research.
Warwood, Byrdeen; And Others
Montana State Univ., Bozeman.
Sponsoring Agency: Montana State Office of the Superintendent of Public Instruction, Helena.
1985; 60p.
EDRS Price—MF01/PC03 Plus Postage.
Document Type: Reports—Research (143)
Major Descriptors: *Computer Assisted Instruction; *Computer Software; *Elementary School Students; *Outcomes of Education; *Skill Development

Before students can use microcomputers effectively, they need keyboarding skills. A project was conducted in Montana to teach keyboarding to fourth-grade children using computer-assisted instruction. Two fourth-grade classes at Hawthorne Elementary School, Bozeman, Montana, participated in an 8-week, 32-session elementary keyboarding pilot program. They were instructed with "Microtype, The Wonderful World of Paws," suitable for grades 3-6, which was selected following a literature search. The students took a pretest and then completed the eight-week course. During the classes, it was found that more than one class period had to be spent on a lesson, especially in the beginning. Children also progressed more rapidly when the keyboards of the Apple microcomputers they were using were covered with paper. Significant progress was reported after the eight-week session, and a posttest showed that all children had made measurable gains in keyboarding skills. However, another posttest administered six weeks after the keyboarding class had finished showed that most of the gains were not maintained. The study concluded that it is feasible to teach keyboarding skills to elementary students and they can learn well, but that they need continuous practice to maintain the newly learned skills. (KC)

Testing

ED272532
A BASIC Microcomputer Program for Estimating Test Reliability.
Cobern, William W.
1986; 35p.
Available from: To obtain copies of the computer program send a MS-DOS formated disk to William W. Cobern, Education Dept. Computer Lab, Austin College, Sherman, Texas 75090.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Reports—Descriptive (141); Computer Programs (101)
Major Descriptors: *Computer Software; *Estimation Mathematics; *Mathematical Models; *Microcomputers; *Test Reliability

This computer program, written in BASIC, performs three different calculations of test reliability: (1) the Kuder-Richardson method; (2); the "common split-half" method; and (3) the Rulon-Guttman split-half method. The program reads sequential access data files for microcomputers that have been set up by statistical packages such as STATPAC. The program is written in MS-DOS BASIC and is intended for use on IBM microcomputers and compatibles. Some of the program's statements may be changed for use on an Apple IIe microcomputer. The bulk of this document contains the main menu program; program flow charts and statements; and lists of variables, arrays, and notations. (GDC)

ED264268
Application of Unidimensional Item Response Theory Models to Multidimensional Data.
Drasgow, Fritz; Parsons, Charles K.
1982; 16p. In: *Item Response Theory and Computerized Adaptive Testing Conference Proceedings (Wayzata, MN, July 27-30, 1982)* (ED 264 260).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Target Audience: Researchers
Major Descriptors: *Computer Simulation; *Item Analysis; *Latent Trait Theory; *Mathematical Models

The effects of a multidimensional latent trait space on estimation of item and person parameters by the computer program LOGIST are examined. Several item pools were simulated that ranged from truly unidimensional to a inconsequential general latent trait. Item pools with intermediate levels of prepotency of the general latent trait were also constructed. These item pools were used to determine the degree of prepotency that is required by LOGIST in order to recover the general latent trait and not be drawn to a latent trait underlying a cluster of items. The types of multidimensionality studied have several effects on the estimation techniques programmed in LOGIST. Perhaps most important is that as the prepotency of the general factor decreases, LOGIST is gradually drawn to the strongest group factor. Estimates of item difficulty occasionally become excessively large in magnitude when actual data sets are analyzed by LOGIST, although the most recent version has options that may reduce this problem. The results obtained here indicate that this phenomenon may partially be due to multidimensional item pools. However, unidimensional models do provide a good description of multidimensional data sets when the dominant latent trait is sufficiently prepotent. (PN)

ED265222
Diagnostic Testing Project.
McArthur, David L.
California Univ., Los Angeles. Center for the Study of Evaluation.
Sponsoring Agency: National Inst. of Education (ED), Washington, DC.
1985; 37p. Some pages have small print.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Reports—Descriptive (141); Computer Programs (101)
Major Descriptors: *Adaptive Testing; *Computer Assisted Testing; *Computer Software; *Diagnostic Tests; *Test Construction

This paper presents an explanation of the program design of the three separate Pascal-language programs which comprise UCLA's Diagnostic Testing Package "DX." The three parts of the DX test package are three closely interrelated programs—Editest, Runtest, and Summary. Editest serves the following functions: (1) the creation of a suitable direct-access file of textual material for each test module; (2) the automatic creation of special files known as cue-files, which provide the requisite program pointers that allow the testing process to be adaptive, and error types to be found within a test; (3) the editing of the direct-access file of text using a simple line-oriented editor; and (4) the review of a specified direct-access file of test materials one screen at a time. The program Runtest is the computive central manager of the adaptive testing sequence, and the student response file is evaluated by the Summary program. Flow charts for each program and test administration are given. Samples are included showing: (1) test item layout; (2) location cue files; and (3) test performance summaries. The Pascal listings for each of the three programs are also appended. (LMO)

ED265221
Teacher's Manual for Using the DX System.
California Univ., Los Angeles. Center for the Study of Evaluation.
Sponsoring Agency: National Inst. of Education (ED), Washington, DC.
1985; 25p.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Guides—Classroom—Teacher (052)
Target Audience: Teachers; Practitioners
Major Descriptors: *Adaptive Testing; *Computer Assisted Testing; *Computer Software; *Diagnostic Tests; *Individual Testing; *Test Construction

A teacher's manual for operating the DX System, a software package for use in diagnostic testing programs, is presented. The DX System is constructed to present test items based on the individual student's pattern of responses. Described are: (1) system components designed to run on an Apple II computer; (2) program options allowing the user to administer tests, collect summary reports, and input new and revised tests; and (3) a system demonstration taking the user through a step-by-step test administration and summary of results, using two prototype tests measuring student performance in pronoun usage and reading comprehension. Included in a section on DX System implementation are subdivisions on test construction, entry of test items, test administration, summaries of results, and teaching and retesting. Samples are given showing test item layout and test performance summaries. A flow chart of test item presentation follows the text. (LMO)

ED264277
Design of a Microcomputer-Based Adaptive Testing System.
Vale, C. David
Sponsoring Agency: Office of Naval Research, Arlington, Va. Personnel and Training Research Programs Office.
1982; 13p. In: *Item Response Theory and Computerized Adaptive Testing Conference Proceedings (Wayzata, MN, July 27-30, 1982)* (ED 264 260).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Target Audience: Researchers
Major Descriptors: *Adaptive Testing; *Computer Assisted Testing; *Computer Oriented Programs; *Feasibility Studies; *Microcomputers

This paper explores the feasibility of developing a single-user microcomputer-based testing system. Testing literature was surveyed to discover types of test items that might be used in the system and to compile a list of strategies that such a system might use. Potential users were surveyed. Several were interviewed, and a questionnaire was developed to determine features needed by users. Evaluation of hardware indicated that microcomputers were available and adequately suitable. However, a typical lack of disc storage for item banks would prevent a system from being acceptable. Work on the software design of the testing system began with a review of existing systems. The design of a complete self-contained system was discussed and included: item banking; test specification; test administration; test analysis system; and a method for reporting the results to examinees. The test authoring system was a two level system (author language and menu system) allowing a division of labor between writers and programmers. An example of test specification is offered. Development of the microcomputer-based system was scheduled to begin in mid-1983 as a second phase for the project in which the design was developed. (PN)

ED264260
Item Response Theory and Computerized Adaptive Testing Conference Proceedings (Wayzata, Minnesota, July 27-30, 1982).
Weiss, David J., Ed.
Minnesota Univ., Minneapolis. Dept. of Psychology.
Sponsoring Agency: Office of Naval Research, Arlington, Va. Personnel and Training Research Programs Office.
1985; 384p. For individual papers, see ED 264 261-277, ED 223 666, ED 243 901, and ED 249 281.
EDRS Price—MF01/PC16 Plus Postage.
Document Type: Collected Works—Proceedings (021)
Target Audience: Researchers
Major Descriptors: *Adaptive Testing; *Computer Assisted Testing; *Computer Oriented Programs; *Latent Trait Theory; *Psychometrics; *Test Theory

This report contains the Proceedings of the 1982 Item Response Theory and Computerized Adaptive Testing Conference. The papers and their discussions are organized into eight sessions: (1) "Developments in Latent Trait Theory," with papers by Fumiko Samejima and Michael V. Levine; (2) "Parameter Estimation," with papers by Frederic M. Lord and Marilyn S. Wingersky, David Thissen and Howard Wainer, and Charles Lewis; (3) "Multidimensional Item-Response Theory," with papers by Roderick P. McDonald, and Mark D. Reckase and Robert L. McKinley; (4) "Estimating Parameters with the E-M Algorithm," with papers by Robert K. Tsutakawa,

and Robert J. Mislevy and R. Darrell Bock; (5) "Unidimensionality and Robustness," with papers by William Stout, Fritz Drasgow and Charles K. Parsons and Douglas H. Jones; (6) "Adaptive and Sequential Testing," with papers by David J. Weiss and Debra Suhadolnik and R. A. Weitzman; (7) "Latent Trait Models for Special Applications," with papers by Susan Embretson (Whitely) and Kikumi K. Tatsuoka; (8) "Applications of Computerized Adaptive Testing," with papers by James R. McBride and J. B. Sympson, J. B. Sympson and Loralee Hartmann, Wolfgang Wildgrube, and C. David Vale. (PN)

Trends

ED272593
Global Societal Trends and the New Technology: Implications for Teacher Credentialing.
Brown, John F.; McKibbin, Michael D.
San Diego State Univ., Calif. National Origin Desegregation Assistance (Lau) Center.
1984; 13p. In: *Educational and Societal Futures: Meeting the Technological Demands of the 1990s. Proceedings of a Conference (Anaheim, California, April 28, 1983)*; see ED 272 584.
EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.
Document Type: Opinion Papers (120); Reports—General (140); Speeches/Meeting Papers (150)
Major Descriptors: *Computer Literacy; *Computer Science Education; *Inservice Teacher Education; *Teacher Certification; *Teacher Qualifications

Contemporary media and communication technology are expanding educational possibilities and probably will alter fundamentally the structure of educational institutions. As yet, however, only the surface has been scratched in applying media and technology to education. Moreover, early experiments, such as closed circuit television, either are not regarded as successful or have not received major acceptance. To make a genuine contribution to effective schooling, new technologies such as computers must be carefully woven into the fabric of the schools. In California, the Commission on Teacher Credentialing for the Future is a state agency that has taken on the task of considering the role of computers in teacher preparation and certification. The agency's primary responsibility is to establish standards for the preparation of public school personnel. The commission desires to produce teachers with skills for the 1990s and the next century. It has proposed the establishment of a multistage credentialing process, and currently is conducting a survey to determine what standards related to computer literacy should be established for future teachers. Besides the necessary amount of skill training, teachers need to be trained in both the potential gains and losses resulting from the use of computer technology. (KH)

ED268962
The Future of Educational Computers. Concept Paper.
Northwest Regional Educational Lab., Portland, OR. Computer Technology Program.
Sponsoring Agency: Alaska State Dept. of Education, Juneau. Office of Instructional Services.
[1985]; 16p.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Opinion Papers (120)
Target Audience: Policymakers
Major Descriptors: *Computers; *Computer Software; *Computer Uses in Education; *Educational Trends; *Futures of Society; *Technological Advancement

Asserting that advances in hardware technology have outstripped educators' anticipations and that software is the key to the successful use of computer hardware, this paper addresses developments in both hardware and software and discusses possible directions for computer use in education. The first section covers the physical attributes of computer hardware and describes changes in memory, operating systems, storage capacity, and input output devices between 1970 and 1985. The decrease in cost of computing power is also described. The paper then examines software developments and asserts that although improvement in instructional software is slow, it is real and can be expected to continue. Characteristics of software are divided into three categories—subject matter content, instructional process or pedagogy, and technical characteristics—and advances in each of the areas are examined. A nine-item bibliography is included. (THC)

SUBJECT APPLICATIONS

Basic Skills

ED269068
Using the Computer to Improve Basic Skills.
Bozeman, William; Hierstein, William J.
1986; 29p. Paper presented at the Annual National Convention of the American Association of Community and Junior Colleges (66th, Orlando, FL, April 12-16, 1986).
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Reports—Descriptive (141); Speeches/Meeting Papers (150)
Target Audience: Practitioners
Major Descriptors: *Computer Assisted Instruction; *Correctional Education; *Prisoners; *Remedial Instruction

These presentations offer information on the benefits of using computer-assisted instruction (CAI) for remedial education. First, William J. Hierstein offers a summary of the Computer Assisted Basic Skills Project conducted by Southeastern Community College at the Iowa State Penitentiary. Hierstein provides background on the funding for the project, the short time frame for planning and implementation, staffing, teacher training, software needs, and student reactions and outcomes. Quotations from project and prison staff, instructors, and inmates are provided, demonstrating the degree to which computer-assisted instruction gained support and generated enthusiasm even among those who were initially skeptical about the project. William C. Bozeman offers an overview of CAI, looking at different modes and features (e.g., drill and practice, tutorial programs, and simulations) and discussing the advantages and effectiveness of the approach. Finally, a software purchase list, including information on vendors and costs, is presented. (AYC)

ED263871
Technology Applications in Basic Skills (TABS). Year One Report-1984.
Lavin, Richard
Merrimack Education Center, Chelmsford, Mass.
Sponsoring Agency: Office of Educational Research and Improvement (ED), Washington, DC. Center for Libraries and Education Improvement.
1985; 179p. For related document, see ED 263 872.
EDRS Price—MF01/PC08 Plus Postage.
Document Type: Reports—Research (143)
Target Audience: Policymakers
Major Descriptors: *Basic Skills; *Computer Literacy; *Curriculum Development; *Educational Technology; *Federal Programs; *Instructional Improvement; *Microcomputers

This report presents the design, organization, and findings of a federally funded project implemented in three Northeastern Massachusetts towns (Burlington, Lunenburg, and Tewksbury), which demonstrated the application of computer technology to school improvement, specifically in the areas of writing, problem solving, and research/study skills in grades 6 through 8. Project purposes are given, as well as reasons for the study, which was designed to address these specific problems: purchase of computer hardware without adequate instructional systems design; introduction of microcomputers and plans for computer literacy instruction with minimal attention paid to present subject matter curriculum; little staff instruction on how to integrate the microcomputer into the existing curriculum or how the technology might alter the curriculum; and lack of systematic methods for courseware evaluation. The project background and setting are described, as well as a list of findings from the first year. Components of the project design are given, including a rationale for the project, project needs, the program development model, the assumptions for the conceptual approach, and the flexibility of the instructional program. Program implementation in each of the three school sites is described, with particular attention given to specific information on technology and the curriculum; hardware, software and other materials; and staff development and training. The report's concluding sections include descriptions of project assistance, project organization and management, and evaluation methods for determining the success of the program implementation. The latter half of the report presents a six-page bibliography and 10 appendices, which include learning module formats, a summary of hardware and software, teacher development college course descriptions, teacher computer skills inventory, and lists of program and behavioral objectives. (JB)

ED270223
Affecting Basic Skills Achievement through Technology. A Research Report on IMPAC.
McDermott, Cecil W.
Arkansas State Dept. of Education, Little Rock.

1985; 220p.
Available from: IMPAC Learning Systems, Inc., National Old Line Building, Room 122, 6th and Woodlane Streets, Little Rock, AR 72201 ($10.00).
EDRS Price—MF01/PC09 Plus Postage.
Document Type: Reports—Research (143)
Target Audience: Practitioners
Major Descriptors: *Academic Achievement; *Basic Skills; *Computer Assisted Instruction; *Computer Managed Instruction; *Elementary School Students

This report focuses on research and development activities related to the 1983-85 Instructional Microcomputer Project for Arkansas Classrooms (IMPAC), under the supervision of the Arkansas Commission on Microcomputer Instruction. The report includes five major sections: (1) research findings that relate to achievement levels in mathematics, reading, and language arts in the elementary school affected by methods other than those involving computer technology; (2) research findings that relate to achievement levels in mathematics, reading, and language arts in the elementary school affected by methods directly related to computer technology, especially computer assisted instruction (CAI); (3) evaluation of IMPAC experimental programs including achievement scores and hardware, software, maintenance, and in-service training; (4) suggestions for implementing cost- and educationally-effective basic skills guidelines involving Computer Managed and Computer Assisted Instruction (CMI-CAI); (5) recommendations for program implementation in grades 3-8 in Arkansas School Districts over the next four years. The report concludes with recommendations for selecting and purchasing hardware and software, recommendations for in-service training, and a discussion of electrical and space requirements for microcomputers. A bibliography containing 73 references is appended. (Author/DR)

ED263872
Technology Applications in Basic Skills (TABS). Year One Report-1984. Executive Summary.
Merrimack Education Center, Chelmsford, Mass.
Sponsoring Agency: Office of Educational Research and Improvement (ED), Washington, DC. Center for Libraries and Education Improvement.
1985; 17p. For related document, see ED 263 871.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Research (143)
Target Audience: Policymakers
Major Descriptors: *Basic Skills; *Computer Literacy; *Curriculum Development; *Educational Technology; *Federal Programs; *Instructional Improvement; *Microcomputers

This executive summary presents information on the design rationale, project coordination, and findings for the first year of the Technology Applications in Basic Skills project (TAES), which was administered by the Merrimack Education Center and designed to implement programs that use the computer and related technologies to increase student competencies in the basic skills areas of writing, problem solving, and research/study skills in grades 6 through 8. The issues addressed in the first year of the project are presented in this report, which describes: how the project was planned and implemented by the Merrimack Education Center with the staff from three school sites in Burlington, Lunenburg, and Tewksbury, Massachuetts; how a program development model was chosen; the major elements of the project design; year one activities; and resulting curriculum changes in each of the three school sites. Ten major findings from year one are listed, and it is concluded that the existing basic skills curriculum often is not configured to make maximum utilization of technology, and that staff uncertainty about the new technologies leads to initial confusion about staff member roles, lack of focus in the curriculum target area, and negative perceptions about lack of incentives and burdens of time. It is suggested that teachers need to broaden their view and perspective of technology in the curriculum and create new contexts for the skills development that is necessary to make appropriate and meaningful uses of technology in the schools. (JB)

Business Education

ED268348
Business and Office Education. Teacher Handbook. Vocational Education. Grades 9-12. North Carolina Competency-Based Curriculum.
North Carolina State Dept. of Public Instruction, Raleigh. Div. of Vocational Education.
1985; 287p. For related documents, see ED 268 343-350.
EDRS Price—MF01/PC12 Plus Postage.
Document Type: Guides—Classroom—Teacher (052)
Target Audience: Teachers; Practitioners
Major Descriptors: *Business Education; *Competency Based Education; *Computer Oriented Programs; *Data Processing; *Office Occupations; *Word Processing

This teacher handbook provides recommended goals and objectives and suggested measures for competency-based courses in the vocational program area of business and office education. A background and overview section contains the philosophy and rationale, discusses thinking skills and programs for exceptional children, and provides notes that explain how to read the goals, objectives, and measures and offer suggestions for student placement, textbook use, and activities. This specific information is then provided for a vocational education competency-based curriculum: purpose and overview (target groups, philosophy, curriculum planning and design) and course of study. For business and office education, grades 9-12, are offered a program description, learning outcomes, and scope and sequence. These courses are included in the curriculum: accounting I-II, computerized accounting occupations I-II, business communications, business data processing occupations I-II, business exploration, business law, business management/ownership, business math, computer applications, introduction to business, introduction to computers, office occupations I-II, recordkeeping, secretarial/word processing occupations I-II, shorthand I-II, and typewriting I/keyboarding and typewriting II. Materials provided for each course include a topical outline and a one-page format for each competency goal that details grade level, skills/subject area, the competency goal, objective(s), and measure(s) (suggestions of ways in which students may demonstrate their ability to meet the objective). (YLB)

ED264389
A Curriculum on Computer Literacy for Employment.
Davis, Barbara Baldwin
Metropolitan Collegiate Center of Germantown, Philadelphia, PA.
1985; 37p.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Guides—Classroom—Teacher (052)
Target Audience: Teachers; Practitioners
Major Descriptors: *Business Education; *Clerical Occupations; *Computer Literacy; *Computer Oriented Programs

This curriculum guide is designed for use in familiarizing students enrolled in business and office occupations courses with the capabilities and operation of computers. The first part of the guide includes a brief description of the course and explains who should take and who should teach computer literacy courses, how much time is necessary to complete the course objectives, which computers and computer programs will be needed, and how students taking the course should be evaluated. Lesson plans are provided for units addressing the following topics: close encounters of the computer kind, who uses computers and what they do, what a computer is, getting to know a computer, data entry for accounts receivable, data entry for bank reconciliation, payroll processing, inventory management, the meaning of the term data processing, customer billing, point-of-sales terminals, and a review of basic computer functions and operations. Each lesson includes some or all of the following: objectives, format information, guidelines for presenting the lesson, a lesson outline, and a suggested assignment. A bibliography of software and work textbooks is included. (MN)

ED270678
The Business Education Student and Microcomputers: Sources of Influence and Information.
Remp, Ann M.
1985; 28p. Paper presented at the Annual Woman Researcher Conference (Kalamazoo, MI, November 8, 1985).
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Major Descriptors: *Business Education; *Computer Literacy; *High School Students; *Information Sources; *Microcomputers; *Sex Differences

Several researchers have stated that male and female students have different microcomputer experiences which result in qualitatively different computer literacy. Data suggest that differences may result from different guidance to the student from family and school. A descriptive study was undertaken to discover the information resources and influences with whom or with which business education students interact concerning microcomputers. High school students (N=526) from 26 business education classes in 11 southeastern Michigan schools responded to a survey on background information, persons with whom they discuss microcomputers, persons who have influenced them, and kinds of sources they would prefer to seek given specific microcomputer related tasks. Analysis of responses supports the gender differences identified in the earlier literature. While students of both genders reported favorable attitudes toward microcomputers in general, they differed in their communications about microcomputers. More male students reported that persons were general contacts and significant influences than did female students. Female students reported talking about computers equally to men and women, while male students reported that four-fifths of their contacts were male. Nearly one-half of the contacts reported by males were friends, with family members making the next largest group. Female students reported family contacts more often than they did friends. In regard to non-personal resources, female students were more positive than males toward reading than were female students. These findings suggest that, although students in general appear to have the necessary confidence and interest in using microcomputers, they may need help in developing their wider sources of information in order to succeed. (Author/NB)

Designed to assist foreign language teachers to become more computer literate, this paper discusses five major types of educational software currently on the market: (1) drill and practice; (2) tutorials; (3) simulations; (4) computer games; and (5) problem solvers. Possible uses for each type of program are given; in addition, specific programs designed for foreign language instruction are provided. It is also suggested that foreign language teachers write their own tutorials using such authoring languages as SuperPILOT by Apple, which is based on PASCAL, or Language Study Center from Teach Yourself by Computer Software, which contains an easy to use mini-authoring language program that allows the teacher to write any number of personalized new lessons following a prescribed format. Finally, cost effectiveness factors to consider in the selection of foreign language software are presented: careful selection of hardware and software, a knowledge of the needs of a particular school, understanding a software's capabilities and classroom applicability, the number of students who will benefit from the program, and an individual teacher's skill in utilizing a particular type of software. A list of references completes the paper. (JB)

ED270545

Jamaica High School Computer-Assisted Bilingual/Bicultural Multi-Skills Project 1984-85. O.E.A. Evaluation Report.

New York City Board of Education, Brooklyn. Office of Educational Assessment.

1986; 38p. Appendices may not reproduce well due to light print.

Available from: Office of Educational Assessment, New York City Board of Education, 110 Livingston Street, Brooklyn, NY 11201.

EDRS Price—MF01/PC02 Plus Postage.

Document Type: Reports—Evaluative (142)

Major Descriptors: *Bilingual Education Programs; *Computer Assisted Instruction; *English Second Language; *Native Language Instruction; *Second Language Instruction

The Computer-Assisted Bilingual/Bicultural Multi-Skills Project at Jamaica High School completed the first year of a 3-year funding cycle in June 1984. The Project served 101 students of limited English proficiency (LEP). Most were Hispanic or Haitian, but other ethnic groups were also represented. The students tended to be from rural, poor areas of their native countries. As a result, many had limited educational experiences; over 50 percent of the students were overage for their grade placement. The project's goals were improving students' English language proficiency; developing native language arts curricula to enhance native language skills and the students' self-image; mainstreaming students into all-English classes as soon as possible; developing career awareness programs for students; developing staff skills in using microcomputers to teach LEP students; providing meaningful parent workshops and seminars; and designing electronic and print instructional materials to meet students' needs in specific content areas in native language arts. Participants took three classes focusing on developing skills in the English language: an English as a second language (ESL) class, a language lab, and the resource room class. The remainder of their program included a variety of mainstream and native language classes. In its first year, the program has been generally successful in meeting its instructional and non-instructional objectives. Performance in ESL, native language, and content-area classes met the criteria proposed. The objectives for student attendance, career advisement, and curriculum development were also attained, while those for staff development and parental involvement were generally met. (KH)

ED262142

John Jay High School Project TRIUNFE, 1983-1984. O.E.A. Evaluation Section Report.

New York City Board of Education. Brooklyn, N.Y. Office of Educational Evaluation.

[1985]; 62p.

Available from: Office of Educational Assessment, New York City Board of Education, 110 Livingston Street, Brooklyn, NY 11201.

EDRS Price—MF01/PC03 Plus Postage.

Document Type: Reports—Evaluative (142)

Major Descriptors: *Academic Achievement; *Bilingual Education Programs; *Computer Assisted Instruction; *Computer Literacy; *Hispanic Americans; *Program Effectiveness

Project TRIUNFE is a bilingual instructional program that served approximately 260 students of Hispanic, Asian, and Haitian backgrounds during the 1983-84 school year at John Jay High School in New York City. It is a transitional program whose major goal is to mainstream students in less than two years. Most significant is its pioneering effort to develop computer-assisted instruction and computer literacy in a bilingual education program. An evaluation of student achievement during the 1983-84 year found that, overall, program students exceeded the project proposal's criterion level on the Criterion Referenced English Syntax Test. Spanish-speaking students made significant gains in native language reading achievement, with Grade 10 and 12 students showing the greatest progress. Data for French-speaking students were inconclusive. The results of a computer literacy test were positive, and students' overall passing rates were 70 percent or better in mathematics, science, social studies, and vocational courses. Finally, the attendance rate of program students was significantly greater than the schoolwide attendance rate. Despite the apparent success of Project TRIUNFE, the evaluators recommend: (1) the restoration of staff responsibilities

according to the original project proposal; (2) strengthening the vocational education aspect of the project; (3) exploring the possibility of using students to help with some project work; (4) stressing the proposed alternative education for the marginal student; and (5) administering the instruments proposed to measure program objectives and revising program objectives as needed, based on students' past performance and on instruments available. (Author/KH)

ED271541
John Jay High School Project TRIUNFE 1984-1985. OEA Evaluation Report.
New York City Board of Education, Brooklyn. Office of Educational Assessment.
1986; 31p. For the 1983-84 report, see ED 262 142.
Available from: Office of Educational Assessment, New York City Board of Education, 110 Livingston St., Brooklyn, NY 11201.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Reports—Evaluative (142)
Major Descriptors: *Academic Achievement; *Bilingual Education Programs; *Computer Assisted Instruction; *Mainstreaming; *Native Language Instruction

Project TRIUNFE provides instruction in English as a second language, native language development, and bilingual instruction in mathematics, science and social studies to limited English proficient Hispanic, Asian, and Haitian students. The program is a transitional program whose major goal is to mainstream students in less than two years. Mainstreamed students maintain contact with project staff through tutoring and career advising. Evaluation findings for the second year of a three-year funding cycle are presented by program objectives. They include the results of student performance in courses and tests, reviews of program materials and records, interviews with relevant personnel, and classroom observations. Overall, program objectives were met for English as a second language, content-area instruction in mathematics, science, and social studies and native language arts instruction, and student attendance. The project did not provide data to assess the objective for student achievement in computer lab classes. (MW)

ED270560
South Bronx High School Computers in Bilingual Education 1984-1985. OEA Evaluation Report.
New York City Board of Education, Brooklyn. Office of Educational Assessment.
1986; 57p.
Available from: Office of Educational Evaluation, New York City Board of Education, 110 Livingston St., Brooklyn, NY 11201.
EDRS Price—MF01/PC03 Plus Postage.
Document Type: Reports—Evaluative (142)
Major Descriptors: *Bilingual Education Programs; *Computer Assisted Instruction; *Program Effectiveness

The Computers in Bilingual Education program at South Bronx High School (New York) completed its first year of operation in June, 1985. The program offered limited English speaking students computer-assisted instruction in English as a Second Language (ESL), native language arts, social studies, math, and science, and also provided instruction in computer literacy. All students were Spanish-speaking, and most were recent immigrants. Despite setbacks in program implementation due to personnel turnover and problems in purchasing computer hardware and software, the program made progress toward achieving its objectives. Students who participated in the program received seven periods of academic instruction in ESL, native language arts, and bilingual content areas that paralleled the mainstream curriculum. Proposed objectives for student achievement in these areas were met fully only in English language courses. Efforts were made to integrate computer-assisted instruction within the academic program, principally within the ESL classes and the math lab. Although the program had problems getting parents to attend meetings, parents did visit the school regularly on an individual basis. Despite setbacks, the program provided students with some exposure to computer use while maintaining a stable, coherent, and consistent academic program. (KH)

Language Arts

ED260452
New Routes to Writing K-8. [Revised].
Archibald, Georgia, Ed.; And Others
Missouri Univ., St. Louis. Dept. of English.
Sponsoring Agency: Fund for the Improvement of Postsecondary Education (ED), Washington, DC.; Monsanto Fund, St. Louis, Mo.; National Endowment for the Humanities (NFAH), Washington, D.C.
1984; 200p. A publication of the Gateway Writing Project. Funding also provided by the Continuing Education-Extension, the College of Arts and Sciences and the Alumni Association of the University of Missouri, St. Louis.
Available from: Gateway Writing Project, English Department, University of Missouri, St. Louis, MO 63121

($7.75, shipped, spiral bound).
EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.
Document Type: Guides—Classroom—Teacher (052); Collected Works—General (020)
Major Descriptors: *Computer Assisted Instruction; *Editing; *Prewriting; *Teaching Methods; *Writing for Publication; *Writing Instruction; *Writing Processes

Drawing on the experiences of teachers of writing in elementary through junior high schools, the teaching strategies presented in this collection are grouped into four sections: prewriting, drafting, editing and publishing, and systems. Topics covered in the prewriting section include listening skills; thinking, speaking, and writing; interviewing; storytelling and spoken experience; perception skills; awakening the senses; and synectics. Topics covered in the drafting section include the autobiography, power writing, composite story-makers, letter writing, poetry structuring, poetry writing, writing across the curriculum, putting history in perspective with the living time line, happy holidays, and writing across the curriculum with a focus on science. Topics covered in the editing and publishing section include revising, elements of style, beginning writing and sentence lifting, peer proofreading, colorful words, playing with modifiers, teaching grammar and mechanics through writing, publishing books, and young authors programs. Topics covered in the systems section include coping with the paperload, writing evaluation, and using computers in the writing process. (HOD)

ED268583
Computers and Language: A Look to the Future. Technical Report No. 371.
Bruce, Bertram C.
Bolt, Beranek and Newman, Inc., Cambridge, Mass.; Illinois Univ., Urbana. Center for the Study of Reading.
Sponsoring Agency: National Inst. of Education (ED), Washington, DC.
1986; 36p.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Reports—Research (143); Information Analyses—General (070)
Major Descriptors: *Computer Assisted Instruction; *Educational Theories; *Futures of Society; *Integrated Activities; *Language Arts; *Theory Practice Relationship

Addressing the issue of what role computers should have in the language arts classroom, this paper argues that computers and language are intimately connected and that previous discussions of the issue have failed to consider this connection. Following a brief introduction focusing on the functions of the computer, the paper discusses four aspects of the computer's relation to language derived from an analysis of computer functions. The aspects discussed deal with computers (1) as tools for representing knowledge, (2) as tools for interpreting symbols, (3) as communication devices, and (4) as redefinable tools. The paper next describes a classroom of the future, identifying ways in which current activities might be used to teach reading and writing, emphasizing that it is appropriate to discuss computer use when thinking of language. The paper concludes with a consideration of several questions for research based on this thesis. Five pages of references are included, and an appendix contains copies of articles written by students using computers and electronic mail. (FL)

ED267424
Exploring the Composing Process with Microcomputers.
Combs, Martha
1985; 12p. Paper presented at the Annual Meeting of the National Reading and Language Arts Educators' Conference (2nd, Kansas City, MO, September 27-28, 1985).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Speeches/Meeting Papers (150); Reports—Descriptive (141)
Major Descriptors: *Microcomputers; *Teacher Attitudes; *Teacher Improvement; *Teacher Workshops; *Word Processing; *Writing Processes

As a result of a telephone survey of 100 experienced elementary and secondary teachers concerning their comfort with computers and the teaching of writing skills, a weekend workshop was designed to help teachers develop some confidence in their skill as writers and to explore the possibilities available when writing with a word processor. The first evening, workshop participants were surveyed as to their attitudes about computers, the writing process, and themselves as writers. The participants then became acquainted with an Apple IIe by working through a short tutorial program that taught the basic operations and keyboard functions. Next, teachers participated in a brainstorming session and their ideas were recorded with a word processing program. When participants indicated satisfaction with the ideas generated they were shown how to save their prewriting ideas on their own disks and how to print a hard copy. The next day revisions were made and the instructor continued to model conferencing techniques. An attitude survey at the close of the workshop revealed that participants felt greater confidence in themselves as writers. As a follow-up, participants completed two additional writing activities using a microcomputer and responded to an attitude survey, reporting a continuing use of the skills gained in the workshop for both personal writing and working with students. (HOD)

ED268482
Comprehensive Instructional Management Systems, Communication Arts, 1984-85. Final Evaluation Report.
New York City Board of Education, Brooklyn. Office of Educational Assessment.
1986; 37p. Prepared by the Instructional Support Evaluation Unit.
EDRS Price—MF01/PC02 Plus Postage. Document Type: Reports—Evaluative (142)
Major Descriptors: *Computer Oriented Programs; *Curriculum Development; *Language Arts; *Program Effectiveness; *Program Evaluation; *Test Construction

The New York City Board of Education's Comprehensive Instructional Management Systems-Communication Arts (CIMS-CA) project is described in this report. The introductory section provides background information on the project (implemented in 1980), the primary goal of which was to develop a holistic communication arts curriculum for kindergarten through grade eight, a corresponding test component, and a computer management system. This section also describes the program objectives for 1984-85, including continued implementation of curriculum and staff development, and developing pilot assessment instruments. The remainder of the report describes the 1984-85 evaluation of the CIMS-CA project, to document the level and quality of program implementation and to assess the program's impact on student achievement in reading and writing. The second section describes the program's components, including administration, instrument development, and staff development activities. The third section presents reactions to and perceptions of the program's instructional component, including effectiveness and weaknesses. The fourth section presents the methodology and results of the student reading and writing evaluation, which indicated improvement in both areas over the course of the year. The final section presents several conclusions based on analysis of program data, with recommendations to continue (1) monitoring dissemination efforts of the program for quality control, (2) providing staff development, (3) monitoring and revising tests, and (4) evaluating and revising curricula. (HTH)

ED262760
[The Computing Teacher. Selected Articles on the Use of Microcomputers in Language Arts Instruction.]
International Council for Computers in Education, Eugene, Oreg.
1985; *Computing Teacher*; Dec 1983-Jun 1985; 46p.
Available from: International Council for Computers in Education, University of Oregon, 1787 Agate Street, Eugene, OR 97403.
EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.
Document Type: Collected Works—General (020); Guides—Classroom—Learner (051); Opinion Papers (120)
Target Audience: Practitioners
Major Descriptors: *Computer Software; *Language Arts; *Microcomputers; *North American Literature

This document consists primarily of a compilation of nine articles, on the use of microcomputers in language arts instruction, that have been extracted from 1983-1985 issues of the journal *The Computing Teacher*. Also included are various software reviews from the same period. The articles include: "Keyboarding Skills: Elementary, My Dear?" (Keith Wetzel/includes bibiliography); (2) "Keyboarding—A Must in Tomorrow's World" (Evelyn Kisner); (3) "Problems of Computer Assisted Instruction in Composition" (Robert M. Hertz); (4) "Teaching Literature with the Help of Microcomputers" (Elaine McNally Jarchow); (5) "The Electronic Writing Machine: Using Word Processors with Students" (Karen L. Piper); (6) "Computer Haiku: A Classroom Experiment with LOGO in the Language Arts" (Bates Hoffer and Pat Semmes); (7) "Follow 2—A Theme Commentary Program" (Leigh Howard Holmes); (8) "Bank Street Writer—Does the Tool Define the Process or Vice Versa?" (Randall Boone); and (9) "'But What Do I Write?'—Literary Analysis Made Easier" (Helen J. Schwartz/includes sample course syllabus). The second section of the document contains reviews of seven software programs: (1) KidWriter, (2) Story Maker, (3) Bank Street Story Book, (4) Story Tree, (5) Bank Street Writer (3 reviews), (6) Bank Street Speller, and (7) Quill. (JB)

ED264575
Using Microcomputers in Elementary Language Arts Instruction. ERIC Digest.
Daiute, Colette
ERIC Clearinghouse on Reading and Communication Skills, Urbana, Ill.
Sponsoring Agency: National Inst. of Education (ED), Washington, DC.
1985; 4p.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Guides—Classroom—Teacher (052); Information Analyses—ERIC IAP's (071)
Target Audience: Teachers; Practitioners
Major Descriptors: *Computer Assisted Instruction; *Computer Oriented Programs; *Computers; *Courseware; *Elementary Education; *Language Arts

Intended for teachers, this digest shows that the computer can offer many efficient tools for expression, student control of writing, and instruction beyond the grammar and spelling drills most commonly associated with com-

puters. The digest discusses the goals of the language arts curriculum, the role of the computer in the language arts curriculum, the types of computer software to use, some methods for integrating computer use into the curriculum, the expectations for student use, ways teachers can become acquainted with computer tools, and introducing young children to the computer keyboard and computer programs. (EL)

ED262434
Some Ideas about Idea Processors.
Dobrin, David N.
1985; 36p. Paper presented at the Meeting of the UCLA Conference on "Computers and Writing: New Directions in Teaching and Research" (Los Angeles, CA, May 4-5, 1985).
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Speeches/Meeting Papers (150); Opinion Papers (120)
Major Descriptors: *Computer Software; *Evaluation Criteria; *Outlining Discourse; *Prewriting; *Word Processing; *Writing Processes

Idea processors are computer programs that can aid the user in creating outlines by allowing the user to move, reorder, renumber, expand upon, or delete entries with a push of a button. The question is whether these programs are useful and should be offered to students. Theoretically, idea processor prioritizes ideas by placing them in a hierarchy. Unfortunately, the idea processor does not really set priorities; it attaches labels indicating priorities that the writer has set. The confusion is between labels or symbols (which are on paper or in the computer) and ideas (which are in the head). The basic limitations of the idea processor are that (1) the meaning of an item on a list is not stable, and (2) the appropriate symbol for the meaning must change when any of the things the item depends on change. Three things need to be adjusted when a program command is used: the idea of what the item means, the idea of what other items mean, and the symbol. The question is whether having to update items is more likely to be a distraction or a way of gaining new insights. Idea processors are not likely to be useful to the ordinary user. Rather, they are likely to be useful to people who regularly plan with outlines, who tend to write things that they are sure about, and who rarely update entries in paper and pencil outlines. (HOD)

ED261399
Teaching Writing: Some Perennial Questions and Some Possible Answers. Occasional Paper No. 85.
Florio-Ruane, Susan; Dunn, Saundra
Michigan State Univ., East Lansing. Inst. for Research on Teaching.
Sponsoring Agency: National Inst. of Education (ED), Washington, DC.
1985; 63p.
Available from: Institute for Research on Teaching, College of Education, Michigan State University, 252 Erickson Hall, East Lansing, MI 48824 ($5.50).
EDRS Price—MF01/PC03 Plus Postage.
Document Type: Opinion Papers (120); Information Analyses—General (070)
Major Descriptors: *Classroom Communication; *Classroom Environment; *Computer Assisted Instruction; *Teacher Role; *Writing Instruction; *Writing Research

Based on the premise that writing research will be useful to educators only to the extent that it offers them conceptual tools to use in framing and solving their own problems, this paper reviews studies that address educators' perennial concerns about writing instruction. Among the questions addressed in the paper are those concerning (1) the current status of writing instruction, (2) the difficulty of improving writing instruction, (3) what research says about writing instruction, (4) who is studying writing, (5) what researchers have learned, (6) what teachers know about the classroom as an environment for writing, (7) the uses of language in the classroom, (8) how classroom communication is related to learning, (9) the teachers' role in writing instruction and how they influence their students' writing, (10) the alternative roles teachers can play in writing instruction, (11) what lies ahead for writing instruction, (12) how computers are used in educational settings, and (13) how educators participate in using computers in the classroom. The paper concludes with an annotated list of 14 titles on writing instruction, theory and research, curriculum, and special needs of students, and a list of special issues of journals dealing with writing instruction. (HOD)

ED268105
The Effects of Computer Aided Spelling Instruction and Traditional Spelling Instruction on Achievement and Attitude.
Gore, Dolores; And Others
1986; 21p. Paper presented at the Annual Meeting of the Association of Teacher Educators (Atlanta, GA, February 22-26, 1986).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Speeches/Meeting Papers (150); Reports—Research (143)
Major Descriptors: *Academic Achievement; *Computer Assisted Instruction; *Spelling Instruction; *Student Attitudes

This study compared the achievement scores for students receiving traditional spelling instruction to achievement scores earned with computer aided instruction. Similarly, attitude measures were compared for the same subjects. Fourth- and fifth-grade pupils received traditional spelling instruction for five weeks. For the next five weeks, students received their spelling instruction via a computer program. Testing was conducted in a traditional end-of-the-week spelling test for the entire experiment. Students' attitudes were measured using a semantic differential at the beginning and end of the computer aided segment of the study. Student achievement improved with computer aided instruction while the attitudes typically did not. (Author)

ED266489
The Software Jungle: Guidelines for Evaluating English Computer Programs.
Hitchcock, Richard B.
1984; 9p. Paper presented at the Annual Meeting of the Developmental Studies Conference (9th, Athens, GA, April 1984).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Guides—Non-classroom (055); Speeches/Meeting Papers (150)
Target Audience: Practitioners
Major Descriptors: *Computer Assisted Instruction; *Computer Software; *Evaluation Criteria; *Instructional Material Evaluation; *Word Processing

Noting that the educational software market is expanding at a precipitous rate, but with considerable variation in quality, this paper outlines a thorough set of tangible and useful questions, based on two years of program design for English and writing lab usage. The major portion of the paper discusses criteria for evaluation in each of the following areas: (1) instructions, (2) user control, (3) screen format, (4) graphics, (5) data handling, (6) reinforcement, and (7) purpose. A sample courseware evaluation form is appended. (HTH)

ED266468
Computers in Thinking, Writing, and Literature.
Marcus, Stephen
1985; 20p. Paper presented at the Annual Meeting of the National Council of Teachers of English (75th, Philadelphia, PA, November 22-27, 1985).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Opinion Papers (120); Speeches/Meeting Papers (150)
Major Descriptors: *Attitude Change; *Computer Assisted Instruction; *Computer Literacy; *Student Attitudes; *Teacher Attitudes; *Technological Advancement

Gender, race, and socioeconomic status are important factors in the experience students have with computers before they reach college classrooms, and these experiences establish the foundation for student and faculty attitudes toward computers. English teachers' attitudes toward computers can be considered in the context of the thinking process model analogous to the writing process: the degree to which teachers' attitudes have resulted from prethinking rather than rethinking of facts, fears, and intuitions reflects humanities writers' and teachers' ambivalent relationships with technology. Historically, computer assisted instruction in writing has ranged from early single-activity drill-and-practice software to the notion of "idea processors." There are now numerous applications for computer assisted instruction in literature: tutorials, word processing activities, data base courseware, creative writing software, and interactive fiction. Attitudes toward this changing technology need to be reexamined. Teachers' prethinking, thinking, and rethinking will be a major force in making the most of current technology and students' preconceptions. (HOD)

ED263943
Using the Word Processor in Composition.
Newton, Sandra S.
1985; 24p. Paper presented at the Northeast Regional Conference of the National Council of Teachers of English (Portland, ME, October 24-26, 1985).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Guides—Classroom—Teacher (052); Speeches/Meeting Papers (150)
Target Audience: Teachers; Practitioners
Major Descriptors: *Computer Assisted Instruction; *Word Processing; *Writing Composition; *Writing Instruction

The use of word processing in composition classes provides the student with both the opportunity to experience a significant technology and the ability to improve the mechanics and style of their writing. Word processing software has many benefits over "drill and practice" programs, "dialogue" software, and "whole process" programs, since word processing software is readily available and a flexible learning tool. When used directly by the student, word processing makes all stages of the composing process (i.e., drafting, writing, and revising) easier and more meaningful. When used by the instructor, word processing software makes possible a higher degree of individualization

in the classroom. As long as the program is capable of storing files and formatting output, it streamlines the exchange of information and the creation of well-presented material. More sophisticated word processors have even greater capabilities, and allow for greater flexibility in manipulating material through features such as embedding (which allows remarks to be inserted into documents on the screen but not to be printed out onto paper); split screens (which allow the writer to keep in sight two different parts of the composition); inserting material; global search (which allows the writer to rapidly search a document for intrusive or annoying repetitions of a word or phrase); word wrap (which automatically moves whole words from the end of one line to the beginning of the next); and spelling check features. (LAL)

ED264566

Leadership in Literacy for the Information Age. A Report of the Committee on Instructional Technology, National Council of Teachers of English. Executive Summary.

Oates, William R., Ed.

National Council of Teachers of English, Urbana, Ill.

1985; 18p.

EDRS Price—MF01/PC01 Plus Postage.

Document Type: Opinion Papers (120)

Major Descriptors: *Computer Assisted Instruction; *Educational Technology; *English Instruction; *English Teacher Education; *Professional Associations; *Word Processing

Responding to concerns of the National Council of Teachers of English (NCTE) Task Force on Excellence in Education that current uses of computers in teaching English language arts may undercut rather than advance excellence, this report, prepared by the NCTE Committee on Instructional Technology, summarizes the committee's thoughts and recommendations on the issue raised. After introducing the issue, the report identifies and discusses five concerns of the committee: (1) the use of computers in teaching composing and edition; (2) computer programs with responsive interaction in reading; (3) qualifications of teachers of word processing; (4) specifying technology in today's K-12 classroom; and (5) communication skills needed in an information society. The report concludes with the committee's recommendations for action: (1) develop a model teacher-training pro[illegible]n to help schools and teachers realize the promise of excellence in teaching English through intelligent use of computers; (2) develop a computer-based communication network to serve as a new medium for teacher and student writing, and as a communication channel for council business; (3) initiate and support a "Schools Recognition Program for Exemplary Use of Instructional Technology in the Teaching of English"; (4) begin a new era of open cooperation and collaboration with business; and (5) become a force advocating greater computer access by English teachers and students. Appendixes provide a discussion of computers and the stages of writing and a decision guide for technology in the classroom. (HOD)

ED264598

Hand in Hand: The Writing Process and the Microcomputer. Two Revolutions in the Teaching of Writing. A Manual for Secondary Teachers.

Parson, Gail

Alaska State Dept. of Education, Juneau. Office of Instructional Services.

1985; 143p. Photographs may not reproduce clearly.

EDRS Price—MF01/PC06 Plus Postage.

Document Type: Guides—Classroom—Teacher (052)

Target Audience: Teachers; Practitioners

Major Descriptors: *Computer Software; *Theory Practice Relationship; *Word Processing; *Writing Instruction; *Writing Processes; *Writing Research

Intended for teachers beginning to integrate the use of computers into the teaching of writing, this manual reports on a computer and writing skills project for teachers and discusses current theory and research in relation to the classroom experience, practical advice, and specific teaching suggestions of the 10 secondary school teachers involved in the project. The six chapters discuss the following: (1) the change from the traditional approach to teaching writing to translating current research into classroom practices; (2) the use of word processors to teach writing; (3) how to get started, including tips on hardware, a discussion of software packages, and reviews of software programs; (4) training students and teachers to use word processing; (5) how the microcomputer and process approach to writing instruction will affect teaching and learning; and (6) final thoughts, surprises, suggestions, and a summary. A list of commercial sources of information is included, and the appendix contains articles on teaching writing by using the word processor and on class-based writing research. (EL)

ED270822

Microcomputers and the Language Arts. English, Language, and Education Series.

Robinson, Brent

1985; 135p.

Available from: Open University Press, Taylor & Francis Inc., 242 Cherry St., Philadelphia, PA 19106-1906 ($15.00).

Document Not Available from EDRS.

Document Type: Guides—Classroom—Teacher (052); Opinion Papers (120); Books (010)

Major Descriptors: *Computer Assisted Instruction; *Language Arts; *Microcomputers; *Reading Instruction; *Speech Instruction; *Writing Instruction

Designed to reveal some of the strengths and weaknesses of microtechnology in the language arts, this book suggests how and where microcomputers might have applications or implications in the language arts curriculum. The first chapter of the book discusses practical problems facing language arts teachers in developing classroom computer programs, including how to gain access to computers, how to choose hardware and software, and where to place them for best use. The second chapter discusses computers and reading instruction, examining such areas as beginning reading, phonics, comprehension, and the higher reading skills. The third chapter deals with computers and writing and reviews computer use in teaching letter formation, spelling, grammar, and punctuation, and also as a stimulus for writing. The fourth chapter covers computers and oracy, touching upon computer recognition of speech, speech synthesis, and computer-student exchanges. The book concludes with a discussion of computers as language users across the curriculum. (FL)

LOGO

ED265833

One Key LOGO and Hands-On Activity Cards.

Friesen, Chuck; And Others

Nebraska State Dept. of Education, Lincoln. Div. of School Assistance & Support.

1984; 121p. Adapted with permission from Lincoln Public Schools. Activity cards may not reproduce due to color stock of cards.

Available from: ITV Services, Nebraska Department of Education, 301 Centenniel Mall South, Lincoln, NE 68509 ($3.00).

EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.

Document Type: Guides—Classroom—Learner (051); Guides—Classroom—Teacher (052)

Major Descriptors: *Computer Software; *Learning Modules; *Microcomputers; *Programing Languages

Developed to assist primary school teachers who wish to implement LOGO and One-Key LOGO (OKL) in their schools, this document consists of a LOGO resource manual and 92 color-coded activity cards designed to guide a pre-reader or primary child through a series of problem solving steps. After a brief introduction, which contains computer terminology and procedures for computer care and operation, the resource manual is divided into sections which illustrate sample procedures and files found on the LOGO student utilities diskettes and present suggestions for their effective use. The contents include: (1) a sample OKL game; (2) a list of what students say they learn with LOGO; (3) troubleshooting tips for OKL; (4) directions for OKL commands; (5) troubleshooting tips for LOGO; (6) directions for LOGO commands; (7) off-computer activities for both LOGO and OKL; (8) sample worksheets for turtle activities; (9) class simulation activities; (10) definitions of LOGO headings and coordinates; (11) commands for LOGO color codes and numeric operations; and (12) LOGO and OKL management aides (OKL mazes and turtle games). Transparency masters are included for some games. (JB)

ED262763

LOGO in the Classroom.

International Council for Computers in Education, Eugene, Oreg.

1985; *The Computing Teacher*; Sep 1983-Mar 1985; 85p. For the 20-session course, Logo in the Classroom, see ED 248 847.

Available from: International Council for Computers in Education, University of Oregon, 1787 Agate Street, Eugene, OR 97403.

EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.

Document Type: Guides—Classroom—Teacher (052); Computer Programs (101); Journal Articles (080)

Target Audience: Teachers; Practitioners

Major Descriptors: *Computer Software; *Microcomputers; *Programing Languages

This collection of articles and features reprinted from *The Computing Teacher* begins with an outline (the table of contents) of a 20-session course, "Logo in the Classroom," by Shirley Torgerson, Mary Kay Kriley, and Janet Stone. The text of the first session and a student exercise sheet are also provided. Five articles included in the collection are (1) "Logo Today: Vision or Reality" (Uri Leron); (2) "Animation with MIT Logo" (Nancy Parks Sopp); (3) "Helping Students with Recursion: Teaching Strategies" (Tim Riordan); (4) "Turtle Fever" (Rick Billstein); and (5) "Putting Logo to Work" (Hillel Weintraub). Copies of a regular feature, "The Logo Center," are also

included. These columns by Kathleen Martin and Tim Riordan address such topics as spirolaterals, adventure stories, tangrams and turtles, databases, polyspirals, sprites, thinking in "chunks," non-graphics applications, and using older students to help teach Logo to younger children. One guest column by Tim Barclay focuses on teaching mathematics with MIT Logo. (JB)

ED264841
Bibliography: Logo 85.
Lough, Tom
National LOGO Exchange, Charlottesville, VA.
1985; 69p.
Available from: Editor, National LOGO Exchange, PO Box 5341, Charlottesville, VA 22905.
EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.
Document Type: Reference Materials—Bibliographies (131)
Target Audience: Practitioners; Researchers
Major Descriptors: *Books; *Computer Software; *Periodicals; *Programing Languages; *Resource Materials

Designed to assist in identifying printed material, support groups, and instructional aids related to the Logo programming language, this bibliography is divided into nine sections: (1) books about Logo, and books with significant Logo references or helpful general information; (2) periodicals dedicated to Logo and periodicals with regular Logo features, special Logo issues, and occasional Logo articles; (3) journal articles; (4) reviews; (5) research group publications; (6) known dissertations and theses reporting Logo related research; (7) Logo aids; (8) Logo groups; and (9) a list of publishers' addresses. (JB)

ED267908
Aspects of Programming Courses That Foster Problem Solving.
Mandinach, Ellen B.
Educational Testing Service, Princeton, N.J.
1986; 32p. Document contains light type. Paper presented at the Annual Meeting of the American Educational Research Association (70th, San Francisco, CA, April 16-20, 1986).
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Major Descriptors: *Academic Achievement; *Computer Software; *Learning Strategies; *Middle Schools; *Problem Solving; *Programing

This study examined the relationship between type of computer programming instruction and successful performance by middle school students. It is argued that characterizing the aspects of programming courses that foster generalizable problem solving skills and domain-specific knowledge is helpful in assessing the potential of computer learning environments. Similarly, examining the achievements of successful programmers, their background characteristics, and the learning experiences that lead to expertise in programming is also helpful. Two exemplary programming courses from the Assessing the Cognitive Consequences of Computer Environments for Learning (ACCCEL) Project were examined in case study format. The teachers, curriculum materials, and instructional procedures were compared and characterized. The teachers' classroom procedures and instructional content were examined to identify critical influences on learning. In conclusion, results indicated that (1) the talented students were the best programmers in the ACCCEL sample and (2) good classroom instruction was an important influence on the knowledge and skills displayed by the talented students. (DST)

ED263906
A Programming Contest for Grades 4-12.
Rand, David; Kimball, Richard L.
1984; 22p.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Guides—Non-classroom (055); Reports—Descriptive (141)
Target Audience: Practitioners
Major Descriptors: *Competition; *Computer Software; *Problem Sets; *Programing

In April of 1984 the Aroostook (Maine) Computer Educators, in conjunction with the University of Maine at Presque Isle, conducted a computer programming contest for county students in grades 4-12. This document describes the structure of that contest, including grade level groupings (4-6, 7-9, and 10-12); rules for team membership; the schedule for the contest; and the three major events: the programming challenges, debugging contest, and the individual entries. Comments on the contest are also included. The major part of the document consists of the appendices, which list the three sets of programming challenges used in the contest by grade level. (JB)

ED267788
The Effect of Logo on Young Children.
Rieber, Lloyd P.
1986; 38p. Paper presented at the Annual Convention of the Association for Educational Communications and Technology (Las Vegas, NV, January 16-21, 1986). For entire proceedings, see ED 267 753.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150); Tests/Questionnaires (160)
Target Audience: Researchers
Major Descriptors: *Computer Assisted Instruction; *Computer Graphics; *Microcomputers; *Problem Solving; *Programming Languages; *Skill Development

This study was conducted to determine whether young children, given the experience of Logo programming, would acquire problem-solving skills and be able to transfer those skills to other areas. The study also investigated Logo's effectiveness in teaching certain fundamental geometric concepts to children who were supposedly not developmentally ready for such materials. Subjects included 25 second grade students from a public elementary school in New Mexico. Treatment consisted of each child receiving approximately 1 hour of Terrapin Logo programming on an Apple microcomputer each week for three weeks. The structure of the programming experience was based on a guided discovery approach; participants were allowed much freedom in their programming choices, yet they were motivated to pursue formal stage thought patterns using a carefully planned positive reinforcement technique. A problem solving measure and a geometric paper-and-pencil test were administered in a pretest-posttest design to the experimental group and to another second grade class in the same district which did not receive any Logo experience. The experimental group showed statistically significant results on both measures, while the control group showed no significant change on either. A list of references, one data table, and two appendices containing sample instructional materials and tests are provided. (Author/JB)

ED270213
A Descriptive Study Comparing Preschool and Kindergarten LOGO Interaction.
Strand, Elizabeth; And Others
1986; 54p. Paper presented at the Annual Meeting of the American Educational Research Association (70th, San Francisco, CA, April 16-20, 1986).
EDRS Price—MF01/PC03 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Target Audience: Researchers
Major Descriptors: *Behavior Patterns; *Classroom Communication; *Computer Assisted Instruction; *Interpersonal Relationship; *Kindergarten Children; *Preschool Children

Aware of some educators' concerns that computers isolate children and are too abstract for children under the age of eight, two studies investigated young children's use of LOGO and their interactions with the computer. Data were collected on kindergartners working in a public school computer lab and on preschoolers using computers in a university-based computer classroom. Using a case study approach, the analysis focused upon what two kindergarteners and two preschoolers said and did while computing. The findings revealed that for the kindergarten children, LOGO facilitated collaborative behavior and enhanced the expression of social and language skills. For the preschoolers, LOGO encouraged highly focused task-related behavior, but did not invite collaborative learning. (Author/HOD)

Mathematics

ED265077
Advisory Listing of Microcomputer Math Programs Correlated to Grades 1-8 Basic Skills Assessment Program (BSAP) Objectives. Revised.
South Carolina State Dept. of Education, Columbia.
1985; 66p. Developed by the Microcomputer Math Advisory Committee. Cover page title: Math Software BSAP Correlation, Grades 1-8 Revised. For previous edition see ED 257 639.
EDRS Price—MF01/PC03 Plus Postage.
Document Type: Guides—General (050)
Target Audience: Teachers; Practitioners
Major Descriptors: *Computer Software; *Educational Objectives; *Elementary School Mathematics; *Mathematics Instruction; *Microcomputers

A committee selected microcomputer software for inclusion in this publication, and then correlated the software to the South Carolina Basic Skills Assessment Program (BSAP) Mathematics Objectives for grades 1-8. It was noted

that this correlation of 93 selected software programs to BSAP Mathematics Objectives should be used only as a beginning point; each program should be previewed and selected on the basis of local needs or objectives. (To facilitate such reviewing, labs with microcomputers and software have been established in six South Carolina locations.) Each software program is assigned a number and is then listed for BSAP objectives for concepts, operations, measurement, geometry, and problem solving, by grade level. Then, each software item is listed, with title, grade level, group size, instructional mode, BSAP objective(s), system requirement, producer, and price. The mathematics objectives for each grade level are included in another section. Guidelines for software evaluation and a producer list for software are also included. (MNS)

ED264091

MATHBOXES: A Program for the Apple II to Teach Children to Solve Basic Word Problems. A Report from the Project Using the Microcomputer to Teach Problem-Solving Skills. Program Report 85-5.

Bebout, Harriett C.; And Others

Wisconsin Center for Education Research, Madison.

Sponsoring Agency: National Inst. of Education (ED), Washington, DC.

1985; 26p. Computer disc that accompanies this document is not available from EDRS.

EDRS Price—MF01/PC02 Plus Postage.

Document Type: Guides—Classroom—Teacher (052)

Target Audience: Teachers; Practitioners

Major Descriptors: *Addition; *Computer Software; *Elementary School Mathematics; *Mathematics Instruction; *Subtraction; *Word Problems Mathematics

This manual is used with MATHBOXES, a computer program written for Apple II microcomputers to help children relate formal mathematical symbols for representing simple word problems to the informal strategies using physical objects that they naturally use to solve them. There is a substantial body of research that documents that young children are capable of solving a variety of simple addition and subtraction word problems by directly representing the action or relationships in the problems with physical objects. However, when they are introduced to formal mathematical symbols, they fail to see the connection between the manipulations they learn for these symbols and the informal strategies they use to solve the problem. MATHBOXES is designed to help children make this connection. The manual includes an overview of the program and directions for using it, discussing the various program options: (1) no numerals; (2) numerals only; (3) numerals and text (with additional choices for canonical-small numbers, canonical-large numbers, missing addend-small numbers, missing addend-large numbers, noncanonical-small numbers, or noncanonical-large numbers); and (4) leaving the program. (JN)

ED267761

A Comparison of the Effects of LOGO Use and Teacher-Directed Problem-Solving Instruction on the Problem-Solving Skills, Achievement, and Attitudes of Low, Average, and High Achieving Junior High School Learners.

Dalton, David W.

1986; 34p. Paper presented at the Annual Convention of the Association for Educational Communications and Technology (Las Vegas, NV, January 16-21, 1986). For entire proceedings, see ED 267 753.

EDRS Price—MF01/PC02 Plus Postage.

Document Type: Reports—Research (143); Speeches/Meeting Papers (150)

Target Audience: Researchers

Major Descriptors: *Academic Achievement; *Computer Assisted Instruction; *Intermode Differences; *Problem Solving; *Student Attitudes

This comparison of the effects of LOGO use with the use of teacher-directed problem-solving instruction, and with conventional mathematics instruction, focused on the problem-solving ability, basic skills achievement, and attitudes of junior high school learners. Students (N = 97) in five seventh grade mathematics classes were systematically assigned to three treatments: a problem-solving strategies instructional treatment that used printed worksheets, a structured LOGO treatment, and a control group. Learners were then assessed on their achievement, attitudes, and higher-level thinking skills using the Program Criterion Reference Test (PCRT), the Comprehensive Test of Basic Skills, the Revised Math Attitude Scale, the School Attitude Measure (SAM), the Test of Cognitive Skills (TCS), and the Test of Non-Routine Problem-Solving Skills. Results indicated that: (1) neither the LOGO group nor the problem-solving strategies group demonstrated any improvement in basic skills achievement as the result of the experimental intervention; (2) the problem-solving group scored significantly higher than the other two groups on both measures of problem-solving skills; and (3) while learners in the LOGO and problem-solving groups scored significantly higher than their counterparts in the control group in the Revised Math Attitude Scale, this can be, in part, attributable to a novelty effect. It is noted that the problem-solving skills fostered through LOGO use may not transfer outside the context of LOGO, since LOGO provides only a single algorithm which may not apply to many types of non-routine problems. A list of references, one graph, and 12 data tables are appended. (JB)

ED263194
Programming and Problem Solving.
Elias, Barbara P.
1985; 8p. Paper presented at the Annual Meeting of the Eastern Educational Research Association (8th, Virginia Beach, VA, February 7-9, 1985).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Major Descriptors: *Cognitive Style; *Computer Assisted Instruction; *Heuristics; *Learning Strategies; *Problem Solving

A study was conducted to examine computer programming as a problem solving activity. Thirteen fifth grade children were selected by their teacher from an above average class to use Apple IIe microcomputers. The investigator conducted sessions of 40 -50 minutes with the children in groups of two or three. Four problems, incorporating the programming content from the Logo unit as well as an element of incompleteness, were typed on individual index cards and explained to the children. As the children solved the problems, they wrote down each command used. A tape-recorded interview with each child followed the problem session. Most strategies followed a trial and error pattern. All children solved the first two problems, ten solved three, and one solved all four. Results indicate that Logo learning, at the introductory level, has the potential for use in problem solving tasks. (Author/LMO)

ED271287
Attributional and Performance Effects of Competitive and Individualistic Feedback in Computer Assisted Mathematics Instruction.
Lewis, Mark A.; Cooney, John B.
1986; 34p. Paper presented at the Annual Meeting of the American Educational Research Association (70th, San Francisco, CA, April 16-20, 1986).
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Target Audience: Practitioners
Major Descriptors: *Attribution Theory; *Competition; *Computer Assisted Instruction; *Feedback; *Individualized Instruction; *Performance

Fifty-two fourth and fifth grade students, randomly assigned to three groups (1) competitive, (2) individualistic, and (3) no feedback control, received differential feedback regarding their performance in two 40-minute computer assisted mathematics sessions per week over six weeks. Attributions regarding academic outcomes in computer assisted mathematics were assessed prior to and following treatment, as was academic locus of control. Measures of rate of progress and achievement were also taken. Children receiving competitive feedback showed an increase in attributions to ability for success, as predicted. A predicted increase in attributions to effort for children receiving individualistic feedback was not found. Contrary to previous findings, gender differences in academic locus of control were not found, although all subjects showed an increase in internal responsibility for academic outcomes over the treatment period. Predicted increases in rate of progress and mathematics achievement by the individualistic feedback group in comparison with the competitive feedback and control groups were not found. Feedback conditions were found to differentially affect males and females with males exhibiting a significantly higher rate of progress than females within the competitive feedback group. Attributions were found to account for a moderate, significant portion of the variance in rate of progress and mathematics achievement. (Author/JM)

ED262989
Mathematics Activities Using Computers. Activities Made to N-Joy. Monograph #2.
Masat, Fran, Ed.
Association of Mathematics Teachers of New Jersey, Vineland.
1985; 61p.
Available from: AMTNJ Monograph, c/o Fran Masat, Glassboro State College, Glassboro, NJ 08028 ($5.00).
EDRS Price—MF01/PC03 Plus Postage.
Document Type: Guides—Classroom—Teacher (052)
Target Audience: Teachers; Practitioners
Major Descriptors: *Computer Oriented Programs; *Learning Activities; *Mathematics Instruction; *Microcomputers; *Secondary School Mathematics; *Teacher Developed Materials

The emphasis of the activities presented in this monograph is on the mathematics done by students in grades 7 through 12 with the aid of microcomputers. The computer is used as an aid, to calculate, to motivate, to handle information, or to display data. The vital part of each activity is not the computer program listing, but the results of the programs, the student's experience with the underlying mathematics, and what the student does with the results. The activities are representative and illustrative of the many ways in which computers are used to present and motivate mathematical concepts and methods, with enjoyment as a key outcome. Some are original, while some

are available in the public domain. For each activity, the following format is used: general topic, specific topic, objective(s), description, uses and extensions, and listing. Student worksheets and sample runs are included for some programs. The general topics included are arithmetic, measurement, computation and problem solving, algebra, geometry, number theory, graphing, probability and statistics, computing and programming, and calculus and advanced mathematics. Program conversion suggestions and software references are appended. (MNS)

ED263016
Self-Regulation While Practicing Addition Facts on the Microcomputer.
Schultz, Karen A.
1979; 50p. Paper presented at the Annual Meeting of the North American Branch of the International Group for the Psychology of Mathematics Education (1st, Evanston, IL, September 5-8, 1979).
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Target Audience: Researchers
Major Descriptors: *Addition; *Cognitive Processes; *Computer Oriented Programs; *Elementary School Mathematics; *Problem Solving

The purpose of the study was to survey self-regulation while responding to the addition facts. First graders' performance on microcomputer practice exercises was observed and recorded. Subjects could choose an analytic mode of operation using a symbolic or a finger strategy; or, they could choose a geometric mode of operation using a pictorial or manipulative strategy. An analysis of protocol data indicated that six subjects progressed from the analytic to the geometric modes of operation as problems increased in difficulty; the remaining seven subjects consistently chose either the analytic or harmonic modes of operation (combination of the analytic and geometric). All subjects were highly successful. Eleven of the 13 subjects scored at least 91% correct on each of the four levels of difficulty. The remaining two subjects scored at least 78% correct on each level. (Author)

ED263213
Representational Models in Middle School Problem Solving.
Schultz, Karen A.
Sponsoring Agency: National Science Foundation, Washington, D.C.
1985; 47p. Paper presented at the Annual Meeting of the American Educational Research Association (69th, Chicago, IL, March 31-April 4, 1985).
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Speeches/Meeting Papers (150); Reports—Research (143); Tests/Questionnaires (160)
Target Audience: Researchers
Major Descriptors: *Cognitive Processes; *Computer Oriented Programs; *Learning Processes; *Mathematics Education; *Models; *Problem Solving

This report was part of the total scope of The Microcomputers and Middle School Problem Solving project. It employed representational models during problem solving in order to study: (1) observable patterns in self-directed use of representational models; (2) correlations between use of models and problem-solving ability; and (3) the motives of students for choosing to use representational models. Seventh-grade students were given 25 number theory problems in the context of some meaningful situation, as opposed to a mathematically abstract situation. A set of representational models was provided for voluntary use. The project covered the entire year and took place in three stages. A Cold Test, a Pretest, and a Posttest were administered to the students. Attitudes and other information were gathered from questionnaires given before and after the study. Each ability group used models a greater percentage of time on the Posttest than on the Cold Test, and the percentage of problem solving success increased from the Cold Test to the Posttest for each ability group. Above average and average ability males used representational models more on the Pretest and Posttest than above average and average ability females. The more concrete the model, the more it was used. Problems, including Cold Problem solving pretest and problem solving pretest and posttest, questionnaires, and computer menu are appended. (LMO)

ED271285
Developing a Computer-Assisted Strategy Training Procedure for Children with Learning Deficiencies to Solve Addition and Subtraction Word Problems.
van Lieshout, Ernest C. D. M.
1986; 19p. Paper presented at the Annual Meeting of the American Educational Research Association (70th, San Francisco, CA, April 16-20, 1986).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Target Audience: Practitioners
Major Descriptors: *Addition; *Elementary School Mathematics; *Learning Disabilities; *Secondary School Mathematics; *Subtraction; *Word Problems Mathematics

Two training procedures were constructed to teach children with learning deficiencies to solve simple addition and subtraction word problems. Each training procedure was evaluated in a separate multiple baseline design across subjects. The experiments were designed to prepare for the development of computer assisted training programs. Two female mildly retarded children (age 14) participated in the first experiment. They were taught to work systematically through the problem task and to pay attention to several important components of the problem text. The training procedures turned out to be effective. Research was continued with a computer assisted training experiment. The computerized training procedure is described in relation to the findings of the first experiment. The second experiment was run with three male disabled children (age 10-11). They were taught to draw a diagram as an external representation of the problem. The diagrams reflected the properties of "change," "combine" and "compare" problem types. This training method appeared to be effective as well. The differences in the nature of the efficiency of these two training methods was discussed. The results were analyzed by graphing correct problems, mean response time, number of errors, and mean percentage of correct steps over training sessions. (Author/JM)

Reading

ED268485
Expert Systems: A Challenge for the Reading Profession.
Balajthy, Ernest
Sponsoring Agency: State Univ. of New York, Geneseo. Coll. at Geneseo.
1986; 14p. Paper presented at the Annual Meeting of the International Reading Association (31st, Philadelphia, PA, April 13-17, 1986). Research also partially funded by the Joint Advisory Council of the New York United University Professions and State University of New York.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Speeches/Meeting Papers (150); Opinion Papers (120)
Major Descriptors: *Computer Assisted Instruction; *Computer Software; *Expert Systems; *Reading Diagnosis; *Reading Instruction

The expert systems are designed to imitate the reasoning of a human expert in a content area field. Designed to be advisors, these software systems combine the content area knowledge and decision-making ability of an expert with the user's understanding and knowledge of particular circumstances. The reading diagnosis system, the RD2P System (Reading Difficulties—Diagnosis and Prescription) based on an expert system shell, guides teachers to an understanding of the possible problems underlying a student's reading difficulties and suggests possible instructional methods to solve those problems. Advantages of the expert systems are that they (1) allow an organization to place untrained staff in key decision-making positions, (2) free professionals from information processing overload so that they can provide services that only humans can offer, (3) bring the best and most expensive of expertise to bear on a problem, (4) are designed so as not to overlook remote possibilities, (5) can be easily updated as new knowledge becomes available, (6) can be used for teaching purposes, and (7) raise questions about the field of expertise and can pinpoint areas where additional research is needed. (Teacher observation data are appended.) (EL)

ED271110
Technology Transfer of a Reading Skill Improvement Program for the National Commission on Libraries and Information Science (NCLIS). Technology Transfer Report.
Duffy, Thomas; And Others
Army Human Engineering Lab., Aberdeen, Md.
1985; 130p.
EDRS Price—MF01/PC06 Plus Postage.
Document Type: Reports—Research (143); Tests/Questionnaires (160)
Target Audience: Policymakers
Major Descriptors: *Adult Basic Education; *Computer Assisted Instruction; *Literacy Education; *Microcomputers; *Reading Skills; *Technology Transfer

A program referred to as Language Skills Computer Assisted Instruction (LaSCAI) was chosen to assist volunteer tutors in improving the reading skills of adults. The program was demonstrated at two libraries—one rural and one urban—and an evaluation was completed to determine its applicability in enhancing the on-going tutoring programs at these sites. Prior evaluations had shown that LaSCAI does improve functional reading ability, so the main focus of the library demonstrations was to determine the value that the tutors and students placed on the LaSCAI program. The qualitative evaluations consisted of pre- and post-interviews with students and tutors to reveal their attitudes toward literacy, tutoring, computers, and the LaSCAI program in general. Results of this evaluation indicate that the program should be very successful when integrated properly into the adult literacy programs in current use in libraries. Specific conclusions are: (1) the LaSCAI program can be used to advantage in a library setting using microcomputers and volunteer tutors to raise the reading level and increase the literacy retention of adult students; (2) a certain

amount of program modification, revision, and documentation is still required to extend this program to other libraries without extensive personnel support; and (3) a single source is needed to administer the application of this program for other libraries, to serve as a clearinghouse for subject matter prepared on disks, and to obtain resources and direct continuing research and development needed to improve and expand the use of the program. (Author/THC)

ED270237
The Relationship between Individual Software Packages and Reading Improvement in an Experimental CAI Program.
Edeburn, Carl E.
1985; 20p. For related document, see ED 252 336 and ED 270 238. Paper presented at the Annual Meeting of the Northern Rocky Mountain Educational Research Association (Jackson Hole, WY, October 11, 1985).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Speeches/Meeting Papers (150); Reports—Research (143)
Target Audience: Researchers
Major Descriptors: *American Indian Education; *Computer Assisted Instruction; *Computer Software; *Reading Achievement; *Student Improvement

Statistical evaluation indicated the effectiveness of 10 software packages used in a 3-year project to improve the reading and language skills of Limited English Proficient (LEP) Native American students. The project was implemented in four Rapid City (South Dakota) schools in which 79% of the Lakota (Sioux) Indian students (grades 3-6) were found to be LEP and focused upon the application of microcomputer software in realizing its goals. Stepwise regression was used to ascertain the relationship between Comprehensive Tests of Basic Skills scores and the number of times a student used a particular software package. Analysis of second-year project data showed that Microzine, Learning Company, and Educational Activities software provided the best gain in vocabulary; Microzine, Data Command, and Universal Systems of Education PAL software contributed most to gains in comprehension; and Microzine was the best predictor of composite reading improvement. Analysis of third-year project data showed Borg-Warner, PAL, and Developmental Learning Materials (DLM) software produced best vocabulary gains; Microzine, Borg Warner, and DLM produced best comprehension gains; and Borg Warner was associated with the best gains in composite reading achievement. Specifications of the computer software packages used are provided. (NEC)

ED269745
Reading and Computers—How Teachers Can Make Them Work Together.
Henney, Maribeth
[1984]; 61p.
EDRS Price—MF01/PC03 Plus Postage.
Document Type: Reports—Descriptive (141)
Major Descriptors: *Computer Assisted Instruction; *Computers; *Computer Software; *Reading Instruction; *Word Processing; *Writing Instruction

Some concerns regarding the use of computers in reading instruction are addressed in this report. The first section explores the similarities and differences between reading printed materials and computer display screens (legibility, portability, etc.) and presents some advantages and disadvantages of computers. The next section explains two ways in which computer programs for education can be categorized: according to the written structure of the program (drill, tutorial, simulation, etc.) and according to student needs (to inform, reinforce, etc.). Next, a software evaluation checklist, provided for teachers, focuses on aspects of programs that facilitate the ease and efficiency of reading, including screen appearance, line breaks, and accompanying documentation. The paper then describes two programs promoting the combined teaching of reading and writing—the Bank Street Writer and the Story Tree from Scholastic—and suggests 24 activities for use with these programs, including correcting misspellings, incorrect grammar, and punctuation; putting sentences in proper sequence; creative writing; and editing. The last section discusses the need for including computer-related books in the classroom library and provides short abstracts of books representing the three main categories of books on computers (computer literacy, programming, and fiction). (LLZ)

ED262771
Not Since Gutenberg: Microcomputers and Reading.
McCall, Cecelia
1984; 13p. Paper presented at the National Conference of the Instructional Resource Center (New York, NY, April 13-15, 1984).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Opinion Papers (120); Speeches/Meeting Papers (150)
Target Audience: Teachers; Practitioners
Major Descriptors: *Computer Assisted Instruction; *Computer Literacy; *Microcomputers; *Reading Instruction; *Television Viewing

Designed to promote the use of microcomputers in reading instruction, this paper attempts to dispell apprehensions that the errors made when adapting television to the classroom may occur again with microcomputers. Examples of the failure of television to teach reading in the 1960s and 1970s are presented, and it is pointed out that television, a watching medium that delivers a lot to the viewer while demanding little more than passivity, has not had any remarkable influence on student performance. It is then suggested that the microcomputer provides an interactive ability that television lacks, and specifically notes that it is a medium which combines the visual with the kinesthetic. It is suggested that the role of the reading specialist in the future will be first to teach computer literacy, then to transfer interest to books. The lack of successful software programs for reading instruction is noted; however, some promising college level computer assisted instruction (CAI) programs are identified and described. Concluding remarks cite the responsibilities of classroom personnel for microcomputer utilization and its potential for producing students who are competent readers and writers. A 14-item bibliography completes the document. (JB)

ED264524

An Exploration of the Use of a Speech-Enhanced Microcomputer-Based Language Experience Program to Facilitate Beginning Reading Instruction. Program Report No. 85-6.

Pittelman, Susan D.; Levin, Kathy M.

Wisconsin Center for Education Research, Madison.

Sponsoring Agency: National Inst. of Education (ED), Washington, DC.

1985; 27p. A report from the Program on Classroom Processes: Skill Development—Language Arts.

EDRS Price—MF01/PC02 Plus Postage.

Document Type: Reports—Research (143); Reports—Descriptive (141)

Major Descriptors: *Artificial Speech; *Beginning Reading; *Computer Assisted Instruction; *Computer Software; *Language Experience Approach; *Reading Research

A research project was undertaken to explore the effects of using a microcomputer equipped with a speech synthesizer to enhance and aid in the individualization of the language experience approach in beginning reading instruction. A prototypic program was developed and pilot-tested with 12 kindergarten children over a three-week period, with each child participating in three individual sessions a week for two weeks. In the third week, the computer was moved into the classrooms to evaluate the benefits that a speech-enhanced system might have on the communicative environment. During the project, three areas were identified in which the microcomputer made distinct contributions to the language experience program: (1) more efficient use of teacher time and materials; (2) increased individualized and independent learning, and (3) increased student motivation. The pilot study confirmed that microcomputers with speech synthesizers can enhance the language experience approach to beginning reading. (Author/FL)

Science

ED264129

Graphing Misconceptions and Possible Remedies Using Microcomputer-Based Labs.

Barclay, William L. Technical Education Research Center, Cambridge, Mass.

Sponsoring Agency: National Science Foundation, Washington, D.C.

1985; 10p. Paper submitted to the National Educational Computing Conference (7th, San Diego, CA, June 4-6, 1986). Document contains several graphs of marginal legibility.

EDRS Price—MF01/PC01 Plus Postage.

Document Type: Reports—Descriptive (141); Speeches/Meeting Papers (150)

Target Audience: Practitioners

Major Descriptors: *Computer Oriented Programs; *Graphs; *Material Development; *Science Education; *Skill Development

Graphing is a common and powerful symbol system for representing concrete data. Yet research has shown that students often have graphical misconceptions about how graphs are related to the concrete event. Currently, the Technical Education Research Center (TERC) is developing microcomputer-based laboratories (MBL) science units that use probes to gather data on such physical phenomena as motion, heat and temperature, and response time. With these probes attached to a microcomputer, real time graphs can be displayed of data as they are being collected. The research component of the project is looking at graphing misconceptions (such as confusing the graph of an event with a picture of the event) and how MBL can help students to learn graphing skills. Preliminary results suggest that MBLs do help in improving graphing skills. Attributes of the MBL science laboratories that seem important in this include: (1) the grounding of the graphical representation in the concrete action of the students; (2) the inclusion of different ways of experiencing the material (visual, kinesthetic, and analytic); and (3) the fast feedback that allows students to immediately relate the graph to the event. (JN)

ED264086

Integrating Microcomputers into Science Education. Computer Technology Program Reports to Decision Makers. Number 6, November 1985.

Batey, Anne

Northwest Regional Educational Lab., Portland, Oreg.

1985; 7p.

EDRS Price—MF01/PC01 Plus Postage.

Document Type: Reports—Descriptive (141)

Target Audience: Policymakers

Major Descriptors: *Computer Oriented Programs; *Computer Software; *Educational Objectives; *Microcomputers; *Science Education

Computers are integrated into science education when they are used as the most appropriate tool or delivery system to support the goals of science education. The goals of science education can be condensed into two general areas. One area concerns the preparation of a science-literate citizenry; the second area concerns understanding the interrelationships of science, technology, and society. Current uses of computers that support these goals include: (1) direct instruction software, which use drill and practice, tutorials, or a combination of both; (2) exploratory software, which allow students to explore a system, manipulate variables, and observe outcomes (including simulation, problem-solving, and inventory programs); and (3) software used in laboratories, business, and industry (laboratory interfacing systems, word processors, database management systems, spreadsheets, and graphing/numerical analysis). To achieve integration of computers into science education requires planning, preparation, and well-organized classroom management strategies. For decision-makers (the change agents), this requires involving science teachers in an active integration process, providing inservice training, organizing a curriculum development effort, and providing such incentives as release time for curriculum development, stipends for additional work, and recognition for the results. (JN)

ED266967

A Validity and Reliability Study of a Computer Simulation Designed to Test for Control of Variables.

Borst, Richard Alan

1986; 12p. Paper presented at the Annual Meeting of the National Association for Research in Science Teaching (59th, San Francisco, CA, March 28-April 1, 1986). Several pages are marginally legible due to light type.

EDRS Price—MF01/PC01 Plus Postage.

Document Type: Reports—Research (143); Speeches/Meeting Papers (150)

Target Audience: Researchers

Major Descriptors: *Cognitive Processes; *Computer Simulation; *Reliability; *Science Education; *Validity

The problem of this study was to develop, validate, and establish the reliability of a computer simulation which would: (1) distinguish between concrete and formal thinking patterns related to control of variables; (2) be easily administered to a class of secondary school age subjects; (3) preserve the interactive aspects of the Piagetian task; (4) be scored using a related computer program; and (5) preserve the questioning of the Piagetian tasks. To accomplish these objectives, 75 secondary school students (38 males and 37 females) were tested using these four instruments: the computer simulation; Piaget and Inhelder's pendulum task; Lawson's Classroom Test of Formal Thinking; and the American Chemical Society Test of High School Chemistry. In addition, a panel of experts evaluated the consistency of the computer simulation with the pendulum task. Based on this evaluation and the statistical relationships between the simulation and pendulum task, it may be concluded that the technique has a degree of construct validity with the pendulum task. Concurrent validity can be established on the basis of the non-parametric correlations examined. Results also indicate a high degree of test-retest reliability ($r = 0.81$). Sex bias was also demonstrated (based on the difference in variance of male and female simulation scores). (Author/JN)

ED268007

Technology in Science and Mathematics Education.

Buccino, Alphonse

1986; 25p. Paper presented at the Annual Meeting of the National Conference on Science and Mathematics Education (Atlanta, GA, March 17, 1986).

EDRS Price—MF01/PC01 Plus Postage.

Document Type: Opinion Papers (120); Speeches/Meeting Papers (150)

Target Audience: Practitioners; Researchers

Major Descriptors: *Educational Trends; *Mathematics Education; *Science Education; *Technology

Provided are several perspectives on technology, addressing changes in learners related to technology, changes in contemporary life related to technology, and changes in subject areas related to technology (indicating that technology has created such new tools for inquiry as computer programming, word processing, online database searches, and collegial communication networks). Also provided are prospectives on the content of mathematics and science education, noting that, within the context of current educational reform, there is a fundamental shift regarding the pur-

poses, audiences, and substantive content of science and mathematics education. For example, science today should be for all students, not just those few students who are talented and motivated for professional careers in science and engineering. Other areas addressed include: (1) current uses of technology (particularly computers) in mathematics and science education; (2) trends influencing the use of technology in education (considering demographic and economic transformation, declining cost of technology, economics of scale and market pull, integration of technologies, and accessibility of technology); (3) the computer as a tool; (4) levels of the mind (word processing, spreadsheets, and databases); and (5) suggestions for publishers. (JN)

ED271288
Problem-Solving Rules for Genetics.
Collins, Angelo
1986; 36p. Paper presented at the Annual Meeting of the American Educational Research Association (70th, San Francisco, CA, April 16-20, 1986).
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Reports—Descriptive (141); Speeches/Meeting Papers (150)
Target Audience: Practitioners
Major Descriptors: *Computer Assisted Instruction; *Genetics; *Problem Solving; *Programed Tutoring; *Science Instruction; *Secondary School Science

The categories and applications of strategic knowledge as these relate to problem solving in the area of transmission genetics are examined in this research study. The role of computer simulations in helping students acquire the strategic knowledge necessary to solve realistic transmission genetics problems was emphasized. The Genetics Construction Kit (GCK) was the simulation program used to generate transmission genetics problems in this study. The two sources of strategic knowledge required to solve these problems came from the rational analysis of each class of problems and from the analysis of the performance of experts solving such problems. The rational analysis and the analysis of the performance of experts were used to modify and supplement each other in order to construct a description of desired performance for solving realistic, computer-generated transmission genetics problems. Information presented on these two sources included: (1) a general description, (2) data redescription, (3) solution synthesis, and (4) solution assessment. It appears feasible that a computer tutoring system together with an expert system can be designed and implemented to enable students to solve realistic computer generated transmission genetics problems. (ML)

ED260800
Young Children and Turtle Graphics Programming: Understanding Turtle Commands.
Cuneo, Diane O.
1985; 23p. Paper presented at the Biennial Meeting of the Society for Research in Child Development (Toronto, Ontario, Canada, April 25-28, 1985).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Target Audience: Researchers
Major Descriptors: *Comprehension; *Microcomputers; *Perspective Taking; *Programing Languages; *Spatial Ability; *Young Children

The LOGO programing language developed for children includes a set of primitive graphics commands that control the displacement and rotation of a display screen cursor called a turtle. The purpose of this study was to examine 4- to 7-year-olds' understanding of single turtle commands as transformations that connect turtle states and to characterize the nature of their misunderstanding. Children were introduced to a highly simplified turtle graphics environment that included four possible turtle orientations and four legal commands. Children were then shown events consisting of an initial turtle state, a command transformation, and the resulting turtle state. They were asked to indicate the key/command involved in each event. Most children systematically misunderstood the commands. Younger ones associated each of the four commands with displacement in a particular direction and rotation to a particular orientation. Overall, most children performed much as Piaget's theory predicts. When the turtle rotated, they tended to focus on features of the final turtle state, ignoring both initial state and transformation information. When the turtle changed location, children seemed to attend to the transformation itself. Younger ones, however, tended to define the displacement from their own or the display screen's frame of reference rather than from the turtle's frame of reference. (Author/RH)

ED266952
The Development of a Test of Computer Literacy for Science Teachers in Grades K-12.
Ellis, James D.; Kuerbis, Paul J.
Sponsoring Agency: National Science Foundation, Washington, D.C.
1986; 20p. Paper presented at the Annual Meeting of the National Association for Research in Science Teaching (59th, San Francisco, CA, March 28-April 1, 1986).

EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Target Audience: Researchers
Major Descriptors: *Computer Literacy; *Measures Individuals; *Science Education; *Science Teachers; *Test Construction

An instrument to measure the computer literacy of science teachers in grades K-12 is being developed. This instrument, the Test of Computer Literacy for Science Teachers (TCLST), is part of ENLIST Micros (a project to develop a curriculum for training science teachers to use computers). The instrument, based on essential competencies for computer literacy for science teachers developed and validated for this project, will be used to evaluate the effectiveness of the ENLIST Micros curriculum at developing those essential competencies in science teachers. In addition, TCLST can be used as a diagnostic test by universities and school districts to determine if teachers have previously achieved computer literacy and also for various purposes by researchers. A 12-step procedure for developing and validating criterion-referenced tests is being used to develop the TCLST. Results of the first eight steps are reported and discussed: preliminary considerations; review of objectives; item writing; assessment of content validity; revisions to test items; field test administration; revision of test items; and test assembly. The test is being piloted with over 200 preservice and inservice science teachers in 10 sites. Results of the pilot study will be used to establish instrument reliability and its construct and decision validity. (Author/JN)

ED270310
Projectile and Circular Motion: A Model Four-Week Unit of Study for a High School Physics Class Using Physics Courseware.
Geigel, Joan; And Others
North Carolina State Univ., Raleigh. Dept. of Physics.
1985; 62p.
Available from: North Carolina State University, Department of Physics, Box 8202, Raleigh, NC 27695-8202 ($6.00).
EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.
Document Type: Guides—Classroom—Teacher (052)
Target Audience: Teachers; Practitioners
Major Descriptors: *Computer Assisted Instruction; *Learning Modules; *Motion; *Physics; *Science Activities; *Science Instruction

A self-paced program designed to integrate the use of computers and physics courseware into the regular classroom environment is offered for physics high school teachers in this module on projectile and circular motion. A diversity of instructional strategies including lectures, demonstrations, videotapes, computer simulations, laboratories, and small group discussions are employed in the four-week plan for the unit. Suggestions for instruction include: (1) description of materials and equipment (emphasizing the role of the Apple II microcomputer in instruction); (2) flow sheet (diagramming instructional options and procedures); (3) materials list (indicating relevant textbooks, courseware, videotapes, and film loops); (4) student learning objectives outline (stating desired behaviors related to projectiles, circular motion, satellites, and the solar system); (5) lesson plan (providing a list of 39 activities for a period of 17 school days); (6) grading suggestions (advocating opportunities for student recognition); (7) hints on use of computers (offering suggestions for classroom management); (8) self-paced consideration (discussing class size, scheduling and teacher monitoring); (9) field test conclusions (containing the student evaluation form and results); and (10) student worksheets (including all activities, quizzes, and information sheets as well as an article from "NASA Facts" (March, 1981) concerning the shuttle era. (ML)

ED264128
The Impact of Microcomputer-Based Science Labs on Children's Graphing Skills.
Mokros, Janice R.
Technical Education Research Center, Cambridge, Mass.
Sponsoring Agency: National Science Foundation, Washington, D.C.
1985; 7p. Paper submitted to the 1986 Annual Meeting of the National Association for Research in Science Teaching.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Target Audience: Researchers
Major Descriptors: *Comprehension; *Computer Oriented Programs; *Elementary School Science; *Graphs; *Microcomputers; *Science Instruction

Microcomputer-based laboratories (MBL), the use of microcomputers for student-directed data acquisition and analysis, represents a promising new development in science laboratory instruction. This descriptive study determined

the impact of MBLs on middle school students' understanding of graphs of distance and velocity. The study was based on the premise that understanding the use and interpretation of symbol systems such as graphs is a central developmental task for all children. Sixth-grade students received five MBL lessons on distance and velocity, where they were challenged to construct different kinds of graphs via their own movements and the movements of a toy cart. Results (based on classroom observations and a post-intervention quiz which required students to match graphs with written descriptions of these graphs) indicated that after experience with MBL, students could accurately match complex graphs of physical phenomena with written descriptions of these graphs. Children attained a mean accuracy level of 85 percent on the matching task which involved graphs of position and velocity (including negative velocity). Observations corroborated these findings, and showed that students' understanding of graphs was resistant to counter-suggestion. By linking the concrete and the abstract, MBL may be providing a bridge that facilitates the development of formal operational thinking. (Author/JN)

ED260888
Supporting Improvement of Instruction in Science, Mathematics and Foreign Language Instruction. Discussion Draft.
Murphy, Ann
Northwest Regional Educational Lab., Portland, OR. Northwest Center for State Educational Policy Studies.
Sponsoring Agency: Chief State School Officers of the Northwest and Pacific.
1982; 12p.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Descriptive (141)
Target Audience: Administrators; Practitioners
Major Descriptors: *Computer Oriented Programs; *Curriculum Development; *Instructional Improvement; *Mathematics Instruction; *Science Instruction; *Second Language Instruction

Data from national and local studies have shown declines: (1) in the quality and quantity of mathematics and science instruction over the past 20 years; (2) in student enrollment in these subjects; (3) in student scores on standardized mathematics and science tests; and (4) in course offerings and enrollment in such foreign languages as German. Ways of addressing these problems include such approaches as upgrading teacher salary schedules, utilizing instructional strategies that emphasize problem-solving rather than rote learning, and developing technology-enhanced courses. It is this latter approach, the enhancement of existing instructional materials through utilization of educational technology (particularly through computer assisted instruction), that is proposed as a powerful means to improving science, mathematics, and foreign language instruction. The development of technology-enhanced mathematics and science courses is discussed, outlining the components of and activities in the development of such courses. Activities in identifying technology-based enhancements to support foreign language instruction are also discussed. Costs for implementing an individualized physics course for five students are included. (JN)

ED262750
A Comparison of Student Achievement across Three Methods of Presentation of a Computer Based Science Simulation. Technical Report Series, Report No. 84.1.5.
Sherwood, Robert D.; Hasselbring, Ted
George Peabody Coll. for Teachers, Nashville, TN. Learning Technology Center.
1984; 16p.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Evaluative (142)
Target Audience: Researchers
Major Descriptors: *Computer Simulation; *Intermode Differences; *Laboratory Procedures; *Microcomputers; *Science Instruction; *Simulated Environment

Research was undertaken to investigate various methods of presentation of a computer based science simulation as it related to student content knowledge of the simulation concepts. Three treatment groups of sixth grade students were used in the study: (1) two students per computer interacting with the simulation; (2) a total class presentation of the computer simulation; and (3) a non-computer game-type presentation of the simulation concepts. Students' content knowledge was measured by a 14-item posttest administered immediately after the presentation and 6 weeks later. No statistically significant differences were found between the treatment groups, although there was a trend for higher scores for the total class presentation group on the immediate posttest multiple choice content items. However, females did less well than males on the multiple choice content items of the test. A sex by treatment group interaction was significant for the delayed posttest, with females performing better than males in the total class presentation method but less well in the paired student method. (Author/JB)

Social Studies

ED271372
How to Incorporate the Computer into the Social Studies Classroom.
Dockterman, David; Snyder, Tom
Tom Snyder Productions, Inc., Cambridge, MA.
1986; 13p.
Available from: Tom Snyder Productions, Inc., Educational Software, 123 Mt. Auburn Street, Cambridge, MA 02138.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Guides—Classroom—Teacher (052)
Target Audience: Teachers; Practitioners
Major Descriptors: *Computer Assisted Instruction; *Computer Uses in Education; *Educational Technology; *Social Studies; *Teaching Methods

This brochure offers answers to 13 questions about using computers in the social studies classroom. Written by teachers for teachers, its goal is to provide a foundation to consider whether or not computers have a place in the classroom and how to go about using them if they do. The questions are: "What's in this booklet?" "Should I be using computers in my social studies classroom?" "What can I do with computers that I couldn't do before?" "Where do I start?" "What can I do with a computer lab?" "What can I do with one or two computers in my classroom?" "What can I do with a computer permanently in my classroom?" "What do I need to know?" "How do I find good software?" "How do I evaluate software?" "How do I find the time to find software, learn how to use it, and become comfortable with the technology?" "Where do I find the space for this equipment?" and "Where can I get the resources for the hardware and software I want?" (TRS)

ED262898
Computers as Media for Communication: Learning and Development in a Whole Earth Context.
Levin, James A.
1985; 15p. Paper presented at the Annual Symposium of the Jean Piaget Society (15th, Philadelphia, PA, June 6-8, 1985).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Descriptive (141)
Major Descriptors: *Computer Oriented Programs; *Learning Activities; *Microcomputers; *Networks; *Problem Solving; *Telecommunications

Educationally successful electronic network activities involving microcomputers and long-distance networks include a student newswire, joint social science projects, and joint science projects. A newswire activity, such as "The Computer Chronicles," can provide a wide range of audiences for writing, a functional environment for reading, and a context for evaluating the writing of oneself and others. Joint social science projects carried out by middle and high school students and teachers at sites in California, Israel, Japan, Alaska, and Mexico have involved students in comparing educational systems across sites, analyzing the news coverage of the "same" event at the different sites, and surveying popular music at the different locations. Joint science projects currently are being organized in which students collect data on some shared problem, jointly analyze the data, and report findings. Not only is this a "functional learning environment" for science instruction, but it also may be a powerful way to teach problem solving. In the longer run, these kinds of joint activities can become a central part of the educational experience. The dynamic support provided by computers and computer networks may make it economically feasible to include an "apprenticeship" model for learning as a central part of our educational system. (RH)

ED271357
Creating and Using Databases in the Social Studies.
Russ, Michael
1986; *Printout*; v3 n3 p3-7 May 1986; 7p.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Guides—Classroom—Teacher (052); Journal Articles (080)
Target Audience: Teachers; Practitioners
Major Descriptors: *Computer Assisted Instruction; *Databases; *Social Studies

Student use of microcomputer databases in social studies is discussed. Databases give students and teachers an opportunity to get involved in information storage, retrieval, and analysis. In the process, students develop skills of inquiry, problem-solving, and critical thinking, as well as many of the basic skills needed not only in social studies but in other school subjects and life outside of school. The technology is now available to give students practical, first-hand experience with real-world information management. The article concludes with a bibliography that features both software and readings. (TRS)

ED266763
Computer Graphics for Use in the Classroom to Illustrate Basic Concepts and Spatial Distributions.
Smith, Alan D.
[1979]; 22p.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Guides—Classroom—Teacher (052); Reports—Descriptive (141)
Target Audience: Teachers; Practitioners
Major Descriptors: *Cartography; *Computer Graphics; *Computer Software; *Concept Teaching; *Spatial Ability; *Visual Aids

The computer packages of PLOTALL, SYMAP, SURFACE II, QUSMO, QUSMO2, QUCRS, and QUTAB are commercially available plotting programs that provide aids for visualizing spatial distributed data and concepts. The incremental drum and line printer plots communicate often vast and difficult-to-interpret tabular data with or without geographic coordinates. All the software packages are easy to understand and require no prior programming knowledge or skills. Due to the multi-discipline nature of graphic display, computer generated plots are an excellent tool for use in the classroom to illustrate sociological, geophysical, business, and mathematical concepts. Most of the plotting routines are, or can be made, available to educational practitioners. Each of the packages is described and eight figures which illustrate their applications complete the document. A short reference list is also provided. (Author/JB)

ED266974
Social Studies. Microsift Courseware Evaluations.
Northwest Regional Educational Lab., Portland, Oreg.
1985; 32p. Compilation by Social Science Education Consortium of NWREL Microsift Courseware Evaluation Sheets (May 1984-Dec 1985). For previous evaluation, see ED 248 162.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Reports—Evaluative (142)
Target Audience: Teachers; Practitioners
Major Descriptors: *Computer Assisted Instruction; *Courseware; *Instructional Material Evaluation; *Social Studies

This compilation of 17 courseware evaluations gives a general overview of available social studies microcomputer courseware for students in grades 1-12. Each evaluation lists title, date, producer, date of evaluation, evaluating institution, cost, ability level, topic, medium of transfer, required hardware, required software, instructional purpose, instructional techniques, available documentation, instructional objectives, instructional prerequisites, content and structure, estimated student time required, potential uses, major strengths, and major weaknesses. Evaluation criteria are summarized in a grid showing evaluator ratings ranging from "strongly agree" to "strongly disagree." Most of the courseware is suitable for use with Apple II microcomputers. Courseware titles are "The Medalists-States" (geography), "U.S. Constitution Tutor" (American government), "Rails West!" (history, economics), "Geography Series: New England" (geography), "U.S. Geography Quiz" (geography), "States and Capitals" (geography), "Political Genie" (political science, history, civics), "States" (geography), "Santa Fe Trail" (history), "Greek Mythology" (history, literature), "Cosmic Carnival" (economics), "U.S. History Databases for PFS: File" (history), "Hometown" (civics, local affairs), "How a Bill Becomes Law" (government), "Law in American History" (history, law), "States and Traits" (geography), and "Countdown, Test Simulator, Authoring and Management System" (any subject or topic). (LH)

Vocational Education

ED261252
Personnel Training—Secondary Vocational Agriculture Teacher Education.
Brown, Herman D.; And Others
Texas A and M Univ., College Station. Dept. of Agricultural Education.
Sponsoring Agency: Texas Education Agency, Austin. Dept. of Occupational Education and Technology.
1985; 103p. Light print throughout document.
EDRS Price—MF01/PC05 Plus Postage.
Document Type: Reports—Research (143); Opinion Papers (120)
Major Descriptors: *Agricultural Education; *Beginning Teachers; *Computer Oriented Programs; *Computer Software; *Material Development; *Vocational Education

This document consists of three parts. The first part is a report on a project conducted to develop computer software needed by vocational agriculture teachers in Texas. The report details the process used to assess and develop software, and provides guidelines that can be used by others in evaluating computer software for vocational agriculture courses. Forms for software evaluation are included. The second part of the document is a report on a study conducted by the Texas Tech University at Lubbock, on integration of computer-based instruction in Texas vocational

agriculture programs. The survey showed that Texas vocational agriculture teachers are using computers in their instruction, but that faster computers and more software are needed. This survey was the basis for the software development reported in the first part of the document. The third part of the document is an essay ("Survival of the Fittest") on the problems of first-year teachers, the causes of beginning-teacher dropout, and suggestions for helping first-year teachers get through the hard times and become proficient and experienced. References are included in the paper. Finally, appendixes to this document contain the computer programs developed in the software project. The programs include the following: The Gradebook Accountant, Land Judging Preparation, Plant Evaluation, 205-Day Adjusted Weaning Weight and Performance Evaluation, and Parliamentary Procedure. (KC)

ED264851
Computers in the Home Economics Classroom.
Browning, Ruth; Durbin, Sandra
Home Economics Education Association, Washington, D.C.
1985; 74p.
Available from: Home Economics Education Association, 1201 Sixteenth Street, NW, Washington, DC 20036.
EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.
Document Type: Guides—Classroom—Teacher (052); Computer Programs (101); Tests/Questionnaires (160)
Major Descriptors: *Courseware; *Family Life; *Home Economics Education; *Home Economics Teachers; *Microcomputers

This guide for teachers focuses on how microcomputers may be used in the home economics classroom and how the computer is affecting and changing family life. A brief discussion of potential uses of the microcomputer in educational settings is followed by seven major sections. Sections 1 and 2 provide illustrations and definitions for microcomputer equipment, steps for making decisions on hardware purchases, minimum hardware items needed, suggestions for evaluating computer software, questions to be asked before purchasing software, and a short evaluation checklist developed specifically for the evaluation of home economics software. Section 3 identifies and explains the three uses for computers in the home economics classroom—computer assisted instruction, computer managed instruction, and the production of student learning materials. Section 4 provides information on 96 specific home economics software programs grouped under the following headings: careers; child development and child care; clothing and textiles; consumer education; family living, values, decision making and self-improvement; foods and nutrition; housing; preschool education; and miscellaneous. Nine future computer skills are projected for home economics teachers in Section 6, and Section 7 identifies seven future uses of computers in the home. Topics which relate to the microcomputer's impact on future life are also discussed, and the document concludes with a collection of five sample home economics computer programs written on an Apple IIe, a glossary of computer terms, a list of software producers and distributors, and suggestions for further reading. (JB)

ED268331
Using the Computer in Special Vocational Programs. Teacher's Guide.
Daniels, Dale; And Others
Hardin County Board of Education, Elizabethtown, Ky.
Sponsoring Agency: Kentucky State Dept. of Education, Frankfort. Office of Vocational Education.
1985; 129p. For a related document, see ED 268 330.
EDRS Price—MF01/PC06 Plus Postage.
Document Type: Guides—Classroom—Teacher (052)
Target Audience: Teachers; Practitioners
Major Descriptors: *Basic Skills; *Computer Assisted Instruction; *Daily Living Skills; *Employment Potential; *Special Education; *Vocational Education

This guide is intended to assist vocational educators in providing computer-assisted basic skills instruction to students in special vocational education programs. Addressed in the individual units of the curriculum are the following topics: components and use of the TRS-80; self-assessment; reading (job clusters); language arts (business letters and applications for secretarial and teacher's aide positions); employability skills and the value of education; mathematical operations; money and work (business math, checking accounts and check registers, proper money management, personal budgets); reasons for drug use and the drug scene; resume writing; library skills; community service and jobs; computation of mathematical averages; fractions; problem-solving skills, and job responsibility and goal setting. Each of these units contains some or all of the following: behavioral objectives, a list of resources needed, student evaluation criteria, instructional text, one or more learning activities or quizzes, sample computer programs, and answers to the activities provided. The guide also includes a pretest, posttest, and list of references. (MN)

ED271556
Microcomputer Applications in Agriculture.
Hilgenberg, Gene; And Others
Mid-America Vocational Curriculum Consortium, Stillwater, Okla.
1984; 336p. Some pages use colored paper.

Available from: Mid-America Vocational Curriculum Consortium, 1500 West Seventh Avenue, Stillwater, OK 74074 (Catalog No. 800200—Apple/800201—Radio Shack: $75.00, including floppy disk).
EDRS Price—MF01 Plus Postage. PC Not Available from EDRS.
Document Type: Guides—Classroom—Teacher (052)
Target Audience: Teachers; Practitioners
Major Descriptors: *Agribusiness; *Agricultural Education; *Agricultural Production; *Computer Oriented Programs; *Microcomputers; *Vocational Education

This curriculum guide is intended to assist persons teaching a course in microcomputer applications in agriculture. (These applications are designed to be used on Apple IIe or TRS-80 microcomputers.) Addressed in the individual units of instruction are the following topics: microcomputer operating procedures; procedures for evaluating and selecting a microcomputer system; microcomputer applications in farm business management, animal science, crop science, horticulture, agricultural mechanics, and agribusiness. Each unit contains some or all of the following: performance objectives, suggested activities for teachers and students, information sheets, transparency masters, assignment sheets, job sheets, tests, and answers to the tests. (MN)

ED271571
Introduction to Nursing Diagnosis. Courseware Evaluation for Vocational and Technical Education.
Irving, Jan; And Others
Ohio State Univ., Columbus. National Center for Research in Vocational Education.
Sponsoring Agency: Office of Vocational and Adult Education (ED), Washington, DC.
1986; 10p. For the basic evaluation form, see ED 244 058.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Evaluative (142)
Target Audience: Media-Staff; Teachers; Administrators; Practitioners
Major Descriptors: *Clinical Diagnosis; *Courseware; *Nursing

This courseware evaluation rates the "Introduction to Nursing Diagnosis" program developed by J.B. Lippincott Co. (The program—not included in this document—is a tutorial for second-year nursing students; it presents diagnosis as a mathematical formula). Part A describes the program in terms of subject area (allied health, nursing) and hardware requirements (Apple II with RAM card or Apple language card, IBM-PC, or Franklin Ace), and indicates its suitability for tutorial or drill and practice at the postsecondary level. Listed next are appropriate instructional grouping (individual and small groups), accompanying materials (user's guide), and time estimate (30-60 minutes). Availability information includes cost ($129.00), policies and copyright restrictions, and contact address. A prerequisite for use is understanding of the nursing process. Part B contains the evaluation criteria in eight categories; reviewer ratings appear as yes, somewhat, no, and not applicable, with explanatory comments. Part C summarizes the evaluation. The strengths of this program are that it provides logical steps to understanding and writing a nursing diagnosis and that it differentiates between nursing and medical diagnosis. Weaknesses are that it requires spelling and typing skills, and that the list of possible answers is too prescribed. A summary section shows that this courseware received overall ratings of "yes" in the categories of subject matter, technical presentation, student interaction, program interaction, and documentation, and "somewhat" for student evaluation and work behaviors; the category of application programs was not applicable. The program was recommended as a useful tool in making nursing diagnosis easier. (SK)

ED264406
Computer Education Curriculum. Connecticut Vocational Technical School System. Version 4.
Kittell, Linda; Walczak, Joseph
Connecticut State Dept. of Education, Hartford. Div. of Vocational-Technical Schools.
1985; 133p.
EDRS Price—MF01/PC06 Plus Postage.
Document Type: Guides—Classroom—Teacher (052)
Target Audience: Teachers; Practitioners
Major Descriptors: *Computer Literacy; *Computers; *Computer Science Education; *Programing; *Word Processing

This computer education curriculum is designed specifically for Connecticut's Regional Vocational Technical Schools' grade 9 computer education course. Each of the 24 lessons is expected to cover at least one class period of 50 minutes. Introductory materials include a listing of course goals and objectives, an outline of sequence and scope via learning outcomes, and recommended resource and reference materials. The components of each lesson may include some or all of the following: title; goal(s); learning outcomes; background information; lists of reference materials and materials needed; vocabulary list; lesson description (outline); hands-on, independent, other, and/or followup activities; assignment/activity sheet(s); study guide; and information sheets (handouts). Lessons cover introducing the Apple, components of the computer, input and output devices, history of computerization, computer systems, storage devices, introduction to software, keyboarding skills, computer applications, business applications, word processing, trade applications, uses and abuses of computers, computers and careers, programming logic, flowcharting, introduction to hands-on programming, and programming in BASIC. A glossary is appended. (YLB)

ED260301
Videodiscs in Voc Ed. Information Series No. 299.
Olivier, William P.
ERIC Clearinghouse on Adult, Career, and Vocational Education, Columbus, Ohio.
Sponsoring Agency: National Inst. of Education (ED), Washington, DC.
1985; 40p.
Available from: National Center Publications, National Center for Research in Vocational Education, 1960 Kenny Road, Columbus, OH 43210-1090 (Order No. IN299—$4.75).
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Information Analyses—ERIC IAP's (071); Guides—Non-classroom (055)
Target Audience: Practitioners
Major Descriptors: *Computer Assisted Instruction; *Online Systems; *Production Techniques; *Videodisc Recordings; *Video Equipment

This paper provides teachers and trainers with the concepts and procedures involved in using interactive videodisc technology for instruction. Described first are types of individualized instruction that have influenced videodisc development: programmed and computer-aided instruction, as well as computer graphics. Then the author explains how video technology operates, stating the advantages of the optical videodisc over videotape. Next, he illustrates different configurations for learner interaction with video. Advantages and disadvantages of such delivery systems as optical reflective disc players and direct-read-after-write disc recorders are described. Examples of the use of interactive videodisc in on-the-job training and instruction are provided. Because few such programs are available, the next three sections elaborate a systematic process for designing, producing, and implementing video training materials. The design section follows the five steps of the Instructional Systems Development process (analysis, design, development, implementation, and evaluation). The topic of production centers around the use of the storyboard as a guideline for all production elements. Film and video production are compared. Next, major considerations in implementation are discussed: site preparation, facility requirements, teacher training, management involvement, and evaluation. The last section describes the author's production of a videodisc on machine lathe operations, a case study encompassing the stages of development, site preparation, field trials, and evaluation. (SK)

ED260224
Lake County Area Vocational Center Computer-Managed Instructional System for Competency-Based Vocational Education. Version 1.1. Instructor Guide.
Parker, Robert; Sands, James
Lake County Area Vocational Center, Grayslake, IL.
1985; 68p.
EDRS Price—MF01/PC03 Plus Postage.
Document Type: Guides—Classroom—Teacher (052); Computer Programs (101)
Target Audience: Teachers; Practitioners
Major Descriptors: *Competency Based Education; *Computer Managed Instruction; *Computer Oriented Programs; *Management Information Systems; *Vocational Education

This instructor's manual is designed to familiarize vocational education teachers with the use of computer-managed instruction (CMI) in competency-based vocational education programs. Discussed in the introductory section of the manual are the basic functions of CMI, tips for getting started, daily recordkeeping procedures, weekly timecard updates, and reports generated by the system. The next section deals with management of databases, task status files, task description files, and student information files. Covered in the remaining two sections of the guide are procedures for monitoring student progress and using a report generator. (MN)

ED271234
CHOICE Cloze. Review Software for Occupational Resources. CHOICE (Challenging Options in Career Education).
Pitts, Ilse, M.; And Others
Mid-Hudson Migrant Education Center, New Paltz, NY.
Sponsoring Agency: Office of Elementary and Secondary Education (ED), Washington, DC. Migrant Education Programs.
1984; 22p. For related documents, see ED 248 086 and ED 271 235-238.
Available from: CHOICE, P.O. Box 250, New Paltz, NY 12561.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Guides—Classroom—Teacher (052)
Target Audience: Teachers; Practitioners
Major Descriptors: *Career Education; *Cloze Procedure; *Computer Managed Instruction; *Courseware; *Migrant Education; *Occupational Information

This computer software manual provides detailed instructions on how to use the Cloze Apple computer program to reinforce job and role information presented to secondary-aged migrant students in the CHOICE Occupational

Resources student text and to retrieve and review student work. The manual includes an introduction, hardware requirements, instructions for making backup copies of the program, learning objectives, uses in a tutorial or classroom setting, description of how the student program works, features of the teacher file, program outline, and general program flow chart. Directions in the Teacher Filer Menu allow the teacher to turn the sound portion of the program on or off, decide if users will have access to a printed summary of their scores, set a date which will appear on all records, set up a class file to store results of each student's work on the program disk, add or delete names within the class file, bring a copy of CHOICE Cloze paragraphs, list student names to a printer, and view students' work after they have used the disk. Student learning objectives include introducing/developing computer awareness, inferring responses from context, recalling reading selection details, promoting/developing techniques of the Cloze format, and fostering independent work. (NEC)

ED267229
Preparing Students for Computer Aided Drafting (CAD). A Conceptual Approach.
Putnam, A. R.; Duelm, Brian
1985; 16p. Paper presented at the American Vocational Association Convention (Atlanta, GA, December 7, 1985).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Speeches/Meeting Papers (150); Guides—Classroom—Teacher (052)
Target Audience: Teachers; Practitioners
Major Descriptors: *Computer Graphics; *Computer Literacy; *Curriculum Development; *Drafting; *Engineering Drawing; *Technical Education

This presentation outlines guidelines for developing and implementing an introductory course in computer-aided drafting (CAD) that is geared toward secondary-level students. The first section of the paper, which deals with content identification and selection, includes lists of mechanical drawing and CAD competencies and a list of rationales for selected competencies from the two preceding lists. Considerations in sequencing the content of the course are also discussed. Addressed in the second part of the paper are the following instructional considerations: purchasing CAD equipment, researching the basic concepts of CAD, having a clear rationale for purchases, forming a selection committee, selecting a CAD system, and negotiating prices. A list of CAD software vendors concludes the presentation. Appendixes to the paper include a lesson plan outline covering four skills addressed in the proposed CAD course. (MN)

ED268291
Grab a Byte. Courseware Evaluation for Vocational and Technical Education.
Rosenfeld, Vila M.; And Others
Ohio State Univ., Columbus. National Center for Research in Vocational Education.
Sponsoring Agency: Office of Vocational and Adult Education (ED), Washington, DC.
1986; 10p. For a related document, see ED 244 058.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Evaluative (142)
Target Audience: Teachers; Administrators; Media Staff; Practitioners
Major Descriptors: *Courseware; *Food; *Home Economics; *Nutrition

This courseware evaluation rates the "Grab a Byte" program developed by the National Dairy Council. (The program—not included in this document—is divided into three sections: Grab-a-Grape uses a quiz-show format to examine students' knowledge of food groups; Nutrition Sleuth reinforces students' nutrient knowledge; and Have-a-Byte analyzes meals in terms of students' nutrient needs.) Part A describes "Grab a Byte" in terms of subjects (food and nutrition) and hardware requirements (Apple II and peripherals), indicates its suitability for 7th-10th grade individual or small group instruction, and lists accompanying materials (instructor and user guides, food list) and time estimate (25-40 minutes). Availability information includes cost ($30.00) and contact address. Part B contains the evaluation criteria in eight categories; reviewer ratings appear as yes, somewhat, no, and not applicable, with explanatory comments. Part C summarizes the evaluation. The strengths of this program are its interesting, easy-to-follow game format and topic. A weakness is that answers are provided too readily in the Nutrition Sleuth section. Summary ratings in the eight categories include the following: subject matter, technical presentation, student interaction, and program interaction—yes; documentation—somewhat; and student evaluation, work behaviors and application programs—not applicable. The final rating highly recommends this courseware as a fun way to learn sound nutrition information. (SK)

ED270631
A Comparison of the Importance of Competencies for Applying Microcomputers in Vocational Education.
Tesolowski, Dennis G.; Roth, Gene L.
1986; 29p. Paper presented at the Annual Meeting of the American Educational Research Association (70th, San Francisco, CA, April 16-20, 1986).
EDRS Price—MF01/PC02 Plus Postage.

Document Type: Reports—Research (143); Speeches/Meeting Papers (150)
Major Descriptors: *Competence; *Computer Oriented Programs; *Microcomputers; *Relevance Education; *Teacher Attitudes; *Vocational Education Teachers

A national sample of 134 vocational educators, representing 6 vocational disciplines (agriculture, business, home economics, marketing and distribution, trade and industrial, and health occupations education), was surveyed to ascertain the relative importance of 47 competencies for applying microcomputers in vocational education. The 12-member DACUM (Developing A CurriculUM) panel that generated the core of this competency profile was used as a comparison group in this investigation. A one-way ANOVA (analysis of variance) procedure was used to determine if significant differences occurred between the groups' importance ratings on the five categories into which the competencies were grouped and their respective competencies. T-tests were used to identify which groups differed significantly. The groups' ratings did not differ on the categories; however, there were significant differences on 5 of the 47 competencies: (1) define the instructor's role in computer-based instruction (CBI); (2) demonstrate an awareness of microcomputer software; (3) assess students' needs for CBI applications; (4) orient students to CBI; and (5) assess students' microcomputer skills. Health, business, and marketing and distribution educators placed the highest level of importance on the five competencies, while home economics, agriculture, and trade and industrial instructors placed the least importance on them. This finding may reflect a split between high-technology and low-technology areas of the curriculum. Mastery of the content related to the 47 competencies can provide vocational teachers with opportunities to apply emerging technologies to the pursuit of excellence in curriculum, instruction, and the advancement of students from school to work. (Author/KC)

SPECIAL POPULATIONS

Adult or Distance Education

ED260288
Computer-Assisted Instruction. An ABE/GED Curriculum Project. Final Report. A 310/Special Demonstration Project 1984-1985.
Rio Salado Community Coll., Ariz.
Sponsoring Agency: Arizona State Dept. of Education, Phoenix. Div. of Adult Education.
1985; 19p. For the resource guide, see ED 260 289.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Descriptive (141)
Target Audience: Teachers; Practitioners
Major Descriptors: *Adult Basic Education; *Computer Assisted Instruction; *Curriculum Development; *Demonstration Programs; *High School Equivalency Programs; *Statewide Planning

A project was conducted to develop and implement a program of computer-assisted instruction (CAI) for students enrolled in adult basic education (ABE) and general educational development (GED) programs throughout Arizona. The following activities were completed during development of the comprehensive ABE/GED CAI program: identification and employment of a trained instructional aide and support personnel, coordination of a concentrated promotional campaign, purchase of supplemental software and GED materials, and dissemination of information concerning GED testing sites in Arizona. The CAI program was integrated with traditional ABE/GED materials and curricula normally provided at the project site in such a manner that students spent approximately half their time using the computer and the other half completing more traditional paper-and-pencil activities. A resource guide was then developed for other ABE/GED programs and agencies throughout Arizona who were considering using CAI. (Attachments to this project report include a screening device used for placing students in the CAI program, a sample student prescription or study guide outlining activities and assignments, and an inventory of materials at the demonstration project site.) (MN)

ED266274
Handbook and Annotated Software Bibliography. Microcomputers in ABE.
Holter, Mary Patricia; Johnson, Carmen
Cincinnati Public Schools, Ohio.
Sponsoring Agency: Ohio State Dept. of Education, Columbus.
1985; 216p.
EDRS Price—MF01/PC09 Plus Postage.
Document Type: Guides—Non-classroom (055); Reference Materials—Bibliographies (131)
Target Audience: Teachers; Administrators; Practitioners
Major Descriptors: *Adult Basic Education; *Computer Oriented Programs; *Computer Software; *Educational Resources; *Media Selection; *Microcomputers

This handbook and annotated bibliography presents discussions, ideas, and resources useful to adult basic education (ABE) program teachers and administrators in implementing educational microcomputing, and describes microcomputer software programs that have been used successfully in ABE. The first part of the book, the handbook, is organized in eight sections. Following an introduction which provides a rationale and organization for the handbook, the second section presents a general discussion of microcomputers in ABE. This is followed by two sections providing information on choosing the hardware and the software for ABE programs. In the next section, staff development for those who work with ABE students and microcomputers is discussed. The following section provides lists of microcomputer resources for ABE, including textbooks, audiovisual materials, curriculum aids, resource centers, and software reviews. The next section suggests sources of funding, while the final section notes the problem of keeping up with new technology. Appendixes to the handbook list staff development aids and provide a glossary. The second part of the book, the annotated software bibliography, contains information on more than 200 microcomputer software programs that have been used effectively with adult students. The bibliography contains three sections. A software curriculum guide lists programs by subject area. Each entry in the bibliography lists program name, publisher, date, materials, subject, instructional type, level of use, and a description. Publishers' names, addresses, and phone numbers are provided. The programs listed are for use with the Apple II family of microcomputers, but many are available for use with other microcomputers. (KC)

ED263888
Effectiveness of Computer-Based Adult Education.
Kulik, Chen Lin C.; And Others
1985; 30p. Paper presented at the Annual Meeting of the American Educational Research Association (69th, Chicago, IL, March 31-April 4, 1985). For a related document, see ED 263 890.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Information Analyses—General (070); Reports—Research (143); Speeches/Meeting Papers (150)
Target Audience: Researchers
Major Descriptors: *Adult Education; *Adult Students; *Computer Assisted Instruction; *Meta Analysis

The meta-analytic approach used in this review is similar to that described by Glass et al. (1981), whose approach requires a reviewer to locate and code studies of an issue, to code study outcomes on a common scale, and to use statistical methods to relate study features to outcomes. The studies considered for use in this meta-analysis came from three sources: references in Orlansky and String's (1979) review of findings on computer effectiveness in military training; a computer search of two data bases, Comprehensive Dissertation Abstracts and ERIC; and branching from the bibliographies in documents located through these computer searches. The procedure yielded 24 studies that met basic criteria for inclusion in the study pool. The instructional outcome measured most often was student learning, as indicated on achievement examinations given at the end of the program of instruction. Findings indicate that computer based education (CBE) usually has positive effects on the adult learner: CBE raised the examination scores of such students by 0.42 standard deviations in the average study. Two study features appeared to be related to the size of achievement effect reported in the studies: type of CBE and publication source for the studies. However, reliable conclusions cannot be reached about long-term cognitive effects of CBE because of the small number of studies in this area. (Author/JB)

ED266420
Adult Literacy and Technology. Report of a Workshop (October 1-2, 1984). Technical Report No. 351.
Nickerson, Raymond S.
Bolt, Beranek and Newman, Inc., Cambridge, Mass.; Illinois Univ., Urbana. Center for the Study of Reading.
Sponsoring Agency: National Inst. of Education (ED), Washington, DC.
1985; 81p. This report follows from a two-day workshop on Adult Literacy and Technology convened by the Adult Literacy Initiative of the U.S. Department of Education, October 1-2, 1984.
EDRS Price—MF01/PC04 Plus Postage.
Document Type: Reports—Descriptive (141)
Major Descriptors: *Adult Literacy; *Computer Assisted Instruction; *Functional Literacy; *Illiteracy; *Literacy Education; *Technological Advancement

The problems and extent of adult illiteracy are presented in this workshop report, which explores how computer and communication technology might be applied in adult literacy education. The introduction provides statistics and a discussion of past and current attempts to teach illiterate adults. The major portion of the report focuses on what literacy is and how technology might be used to facilitate the teaching of reading, writing, and related skills. The report concludes by offering recommendations pertaining to five topics: principles and perspective, research, development, service delivery, and evaluation. (HOD)

ED268356
An Adult Basic Educator's Directory of Software for Microcomputers.
Pierce, W. Lee; And Others
University of Southern Mississippi, Hattiesburg.
1985; 176p.
EDRS Price—MF01/PC08 Plus Postage.
Document Type: Reference Materials—Directories/Catalogs (132)
Target Audience: Teachers; Administrators; Practitioners
Major Descriptors: *Adult Basic Education; *Computer Assisted Instruction; *Computer Oriented Programs; *Computer Software; *Evaluation Methods; *High School Equivalency Programs

This document is a guide to an annotated bibliography of software for use with microcompuers in adult basic education (ABE) classes. Some materials also are suitable for use in General Educational Development (GED) classes. The directory contains software reviews in the following categories: tools (such as word processing, spreadsheets), computer literacy, language arts, life skills, mathematics, miscellaneous educational areas, problem solving, science, and social studies. Each review contains title, date, version, vendor, subject area, level, program type, price, computer needed, auxiliary equipment needed, availability of instructional manual, appropriateness for ABE and/or GED, recommendation for use, and comment. The document also contains guidelines for choosing hardware and educational software, and a description of the PLATO and PLATO/WISCAT systems. Appendixes include a bibliography, a software evaluation checklist, and a glossary. Software is indexed by title, by publishers, and by type. (KC)

ED268340
Software Buyer's Guide. 3rd Edition.
Region X Adult Education Software Consortium, The Dalles, OR.
1986; 57p.
EDRS Price—MF01/PC03 Plus Postage.
Document Type: Reference Materials—Directories/Catalogs (132)
Target Audience: Teachers; Administrators; Practitioners
Major Descriptors: *Adult Basic Education; *Adult Programs; *Computer Assisted Instruction; *Computer Oriented Programs; *Computer Software; *High School Equivalency Programs

This buyer's guide is based upon more than 300 software reviews made by members of an educational consortium in Oregon, all of whom work with adult students. The guide represents the recommendations for a core program in adult basic education and is split into two parts: (1) an initial kit, which is designed for those who are just beginning to set up a computer-assisted instructional program and who have only a limited amount of funds; and (2) an advanced kit, which recommends more programs, including management systems that are more expensive. All the programs are being used currently in adult basic education, general educational development, and developmental education programs in the Northwest. The software catalog contains a curriculum guide, the listing of the software programs with annotations, price guidelines, and publishers' addresses. Curriculum areas covered by the programs listed include the following: computer literacy, English/grammar and usage, English/composition, mathematics, problem solving, reading, science, social science, spelling, teacher aids, vocabulary, and word processors. A sample blank rating form that the reviewers used to rate the software programs is included in the book. All programs reviewed are available for Apple Computers. (KC)

ED268342
Software Reviews for Adult Education.
Merrimack Education Center, Chelmsford, Mass.
Sponsoring Agency: Massachusetts State Dept. of Education, Boston. Bureau of Student, Community and Adult Services.
[1985]; 124p. For a related document, see ED 268 341.
EDRS Price—MF01/PC05 Plus Postage.
Available from: Merrimack Education Center, 101 Mill Rd., Chelmsford, MA 01824 ($15.00).
Document Type: Reference Materials—Directories/Catalogs (132)
Target Audience: Teachers; Practitioners
Major Descriptors: *Adult Basic Education; *Adult Programs; *Computer Assisted Instruction; *Computer Software; *English Second Language; *High School Equivalency Programs

This directory contains 111 reviews of computer software programs suitable for use in adult basic education, general educational development, and English as a second language (ESL) programs. Each one-page review contains the following information: program title, version, producer, cost, hardware requirements, typical run time, back-up disk, appropriate uses, specific subject/skill area, instructional mode, description, and rating of program quality, recommendation, and comments. Programs were reviewed by one to three reviewers. Curriculum areas covered by the software reviews are computer literacy, ESL, language arts, life skills, mathematics, reading, science, and social studies. An evaluation of programs for the teacher is also reviewed. The final section of the guide contains a list of the most useful programs for adult education. (KC)

Handicapped Learners

ED261512
Lost at Sea: Survival Manual on Microcomputers.
Ankney, Barry
Illinois State Univ., Normal.
Sponsoring Agency: Department of Education, Washington, DC.
[1983]; 66p.
EDRS Price—MF01/PC03 Plus Postage.
Document Type: Guides—Classroom—Teacher (052)
Target Audience: Teachers; Practitioners
Major Descriptors: *Computer Assisted Instruction; *Computer Managed Instruction; *Computer Software; *Disabilities; *Microcomputers; *Special Education

The information is offered to acquaint teachers with the scope and nature of microcomputer applications in special education. A brief history of computers traces the changes in the past 40 years. Information on basic computer operations covers such aspects as data storage, the nature of application programs, disk drives, and floppy disks.

Step-by-step instructions are offered for using the Apple computer. Lessons are provided on the following topics: disk initialization, initialization of other diskettes from the initialized diskette, and disk operating system commands. Other topics addressed include BASIC programing, graphics, types of software (such as data base programs, word processing, and computer managed instruction programs), and software evaluation. A brief look at future trends and a list of selected programs of interest to special educators conclude the paper. (CL)

ED261510
Computer Technology for the Handicapped in Special Education and Rehabilitation: A Resource Guide. Volume II.
Browning, Philip; And Others
International Council for Computers in Education, Eugene, Oreg.; Oregon Univ., Eugene. Rehabilitation Research and Training Center in Mental Retardation.
Sponsoring Agency: National Inst. of Handicapped Research (ED), Washington, DC.
1985; 136p. For Volume I, see ED 233 522.
Available from: International Council for Computers in Education, 1787 Agate St., University of Oregon, Eugene, OR 97403 ($10.00).
EDRS Price—MF01/PC06 Plus Postage.
Document Type: Reference Materials—Bibliographies (131)
Major Descriptors: *Computer Assisted Instruction; *Computer Oriented Programs; *Computer Software; *Disabilities

The guide presents annotations on 335 resources, journal articles, books, associations, and reports dealing with computer utilization for handicapped persons in rehabilitation and education. Author and subject indexes precede the annotations which are arranged alphabetically. Citations usually include information on title, author, source, date, and address as well as a brief summary. The following subjects are among those addressed in the resource guide: communication (functional aids, speech recognition, speech synthesis, systems, and touch sensitive monitors), computer assisted instruction, functional aids for communication and self-help/independent living, computer management, research, and computer software. (CL)

ED267260
The Computer as an Instructional Tool in Special Vocational Programs (VIP-Liaison).
Cline, Ann Willett; Snyder, Douglas
Western Kentucky Univ., Bowling Green. Center for Career and Vocational Teacher Education.
Sponsoring Agency: Kentucky State Dept. of Education, Frankfort. Office of Vocational Education.
1985; 50p.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Guides—Non-classroom (055); Reference Materials—Directories/Catalogs (132)
Target Audience: Teachers; Practitioners
Major Descriptors: *Computer Software; *Disabilities; *Instructional Material Evaluation; *Special Education; *Vocational Education

This software resource directory is designed for use by teachers in the Vocational Improvement Programs (VIP)/Liaison in Kentucky who work with secondary special needs learners enrolled in a vocational education program. Section A contains a literature review of available information as it relates to microcomputers, education, and special needs learners. A list of reference books provides annotations that highlight the key concepts. Periodicals on microcomputers and special needs are cited. Section B is a software evaluation form. Section C consists of two lists: list I, "Software Suggestions," is a sample of available programs that represent vocational and academic courseware and teacher utilities; list II, "Additional Software," identifies programs recommended by external sources that are appropriate for special education and/or vocational education. Section D lists producers/distributors of software in alphabetical order. This information is provided: mailing address, telephone number, type of hardware supported, distribution policy, and a short annotation of types of software produced or distributed. Section E provides a quick reference chart for information about the types of software available from the companies listed in section D. (Throughout, resources available at the Center for Career and Vocational Teacher Education, Western Kentucky University, are so indicated.) (YLB)

ED266610
IEP Management Programs.
Davis, Bill
Northwest Regional Educational Lab., Portland, Oreg.
1985; *Reports to Decision Makers*; n7 Nov 1985; 5p.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Guides—Non-classroom (055)
Major Descriptors: *Computer Managed Instruction; *Disabilities; *Individualized Education Programs; *Management Information Systems

The paper examines the use in special education of computerized data management systems (CDMS). CDMS are electronic report generators and databases that provide individualized records (Individual Education Plans or IEP) in a structured format. Examples of software functions and hardware required are cited. Three major sources of software for IEP management, with their costs, are summarized (commercial and noncommercial sources, and database management programs) and software selection criteria are offered. Among the advantages noted for the computerized approach are decreased preparation time and increased teacher efficiency and proficiency. Disadvantages include program variance and the need for staff training. It is concluded that although computerization of the IEP process is still in its infancy, early reports on its effectiveness have been positive. (CL)

ED268774

The Teaching/Learning Process of Handicapped Children in the Microcomputer Environment.

de Bernard, Ann Evans; Ferber, Gloria P.

1986; 43p. Paper presented at the Annual Convention of the Council for Exceptional Children (64th, New Orleans, LA, March 31-April 14, 1986).

EDRS Price—MF01/PC02 Plus Postage.

Document Type: Speeches/Meeting Papers (150); Reports—Research (143)

Major Descriptors: *Cognitive Development; *Computer Assisted Instruction; *Disabilities; *Microcomputers; *Problem Solving; *Theories

The paper reports observations from a 2-year investigation of teaching/learning processes as they occurred during microcomputer instruction in three special education schools. Factors in the learner and/or learning environment are analyzed for their effects on the development of problem solving strategies. Part 1 reports observations of behavior of 212 3-to-12-year-olds with language or cognitive impairments in three microcomputer environments (instructional software, Logo, and teacher mediated learning). Behaviors were classified according to a scheme of cognitive distancing. Findings revealed relationships between age and level of cognitive distancing for all treatments, and between treatment and level of cognitive distancing for all ages. Part 2 of the study examined the relationship between performance in Logo instruction and level of cognitive development from a perspective based on L.S. Vygotsky's theories. A concept attainment task was administered to 15 Ss randomly selected from the larger group targeted for observation. Behaviors on this task were compared to behaviors demonstrated by Ss during interactions with Logo. Results suggested a strong relationship between level of cognitive development and ability to profit from Logo instruction. (Author/CL)

ED264048

Early Childhood/Handicapped Special Project: Software Evaluation.

Education Service Center Region 11, Ft. Worth, Tex.

1985; 56p. Paper presented at the Meeting on "Perspectives on the Young Child and the Computer" (Austin, TX, September 27-28, 1985).

EDRS Price—MF01/PC03 Plus Postage.

Document Type: Speeches/Meeting Papers (150)

Major Descriptors: *Computer Software; *Disabilities; *Preschool Education; *Teacher Response; *Teaching Styles

Thirty-seven commercially available software programs were circulated among 13 teachers of 3- to 5-year-old handicapped children in order to: (1) evaluate commercially available software advertised as appropriate for the preschool population; (2) identify for future use in evaluating software the characteristics of software appropriate for the preschool population; and (3) evaluate the possibility and educational efficacy of preschool handicapped students learning at computers. Software for the Apple II, the TRS-80, and the Commodore 64 were available for evaluation. Data were collected from informal observation and interviews with approximately 50 percent of the participants. Evaluations reflected a range of programs for each computer with Apple II software generally ranking higher than others. Participants consistently identified several characteristics of better software programs and computer systems. These included color monitors; audio volume control; size, shape, clarity of graphics; audio and visual prompts; audio and visual reinforcers; and animation. Interviewed participants stated age- and skill-appropriate software could be incorporated into the early childhood handicapped classroom as an independent learning center, a small group activity, an individual tutorial, or a free-time reward. All interviewed participants stated they would use computers, as available, in the future. (RH)

ED263697

A Computer-Based Curriculum for Head-Injured Students, Intended for Implementation in the Massachusetts Public Schools.

Feer, Michael

Sponsoring Agency: Massachusetts State Dept. of Education, Boston. Div. of Special Education.

[1985]; 175p.

EDRS Price—MF01/PC07 Plus Postage.

Document Type: Reports—Descriptive (141); Opinion Papers (120)
Major Descriptors: *Cognitive Processes; *Computer Assisted Instruction; *Microcomputers; *Neurological Impairments

The report discusses a program incorporating cognitive therapy with microcomputer technology for head injured students. The goals of cognitive rehabilitation are introduced, the nature and extent of the head injury problem analyzed, and social, emotional, and educational considerations of adolescent head injury illustrated through a case study. The relationship of the computer to cognitive therapy is examined, and advantages of computer applications stressed. The program at a special school for handicapped students is reviewed, its computer components described, and the program's four sectors considered: stress management, retraining of lower level thinking skills, instruction in higher level conceptual skills, and peer support. Software examples used for each component are detailed, and sources of software are discussed (in-house, public domain, commercial). Additional information is provided on peripherals and "typical" sessions. Following case history data, the report examines implementation of such a program within the public schools. A list of software sources and an annotated bibliography conclude the document. (CL)

ED263721
Computer Applications for Students with Behavior and Learning Problems: Teacher's Manual.
Fick, Landis F.; And Others
Sponsoring Agency: Department of Education, Washington, DC.; Iowa State Dept. of Public Instruction, Des Moines.
1984; 109p. A product of Project Iowa.
EDRS Price—MF01/PC05 Plus Postage.
Document Type: Reports—Research (143); Guides—Non-classroom (055)
Target Audience: Practitioners
Major Descriptors: *Behavior Disorders; *Computer Assisted Instruction; *Computer Software; *Learning Disabilities; *Microcomputers

The handbook describes first year results of a project involving microcomputers in the education of behaviorally disordered students. Following an overview of computer assisted instruction (CAI), the book specifies project goals and research questions. Software selection is examined in terms of instructional factors, program decisions, and motivational factors. Three pilot studies are then discussed which explore the motivational capacity of microcomputer free time as an individual classroom reinforcement activity; the studies highlighted topics of reinforcement preference, reinforcement selection, and motivation for behavior change. Additional studies include case study and traditional investigation of CAI for students with attentional difficulties, in interpersonal problem solving for adolescents in Learning Disabled/Behaviorally Disordered classrooms, in impulse control, and in fostering cooperative group skills. Appended materials include a software evaluation guide and a bibliography on microcomputers and computer technology. (CL)

ED265686
Expert Systems and Special Education.
Hofmeister, Alan M.; Ferrara, Joseph M.
Sponsoring Agency: Special Education Programs (ED/OSERS), Washington, DC.
[1984]; 16p.
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Descriptive (141)
Major Descriptors: *Artificial Intelligence; *Computer Managed Instruction; *Disabilities; *Special Education

The application of artificial intelligence to the problems of education is examined. One of the most promising areas in artificial intelligence is expert systems technology which engages the user in a problem-solving dialogue. Some of the characteristics that make expert systems "intelligent" are identified and exemplified. The rise of expert systems is reviewed, and selected present and potential applications of expert systems to the field of learning disabilities are presented, such as the development of an instructional prescription based on assessment information, the classification of students based on assessment information, and the selection of appropriate behavior management strategies based on classroom observational data. (CL)

ED267559
Microcomputers for Early Childhood Special Education. Monograph Number 2.
Hurth, Joicey
North Carolina Univ., Chapel Hill. Technical Assistance Development System. Sponsoring Agency: Special Education Programs (ED/OSERS), Washington, DC.
1985; 48p.
EDRS Price—MF01/PC02 Plus Postage.

Document Type: Reference Materials—Directories/Catalogs (132)
Target Audience: Practitioners
Major Descriptors: *Computer Assisted Instruction; *Computer Managed Instruction; *Disabilities; *Early Childhood Education; *Microcomputers

Intended for projects in the Handicapped Children's Early Education Program (HCEEP) network, the directory presents information on applications of microcomputer technology. The first major section documents microcomputer use in HCEEP projects, noting instructional as well as administrative applications. Brief descriptions focus on major projects or commitments of time and effort, innovative or helpful uses of technology, and products or processes developed by the project and available to be shared with others. Instructional uses include computer assisted as well as computer managed instruction, while administrative applications include data management and analysis, tracking and referral systems, and budget management/cost analysis procedures. The second portion of the document describes resources throughout the United States that can support projects' use of microcomputers and inform them about current developments in this expanding area of special education technology. Technical assistance and software evaluation projects are among those noted. (CL)

ED264850
Computer Literacy Training Modules for Special Educators. Bulletin 1749.
Lopez, Antonio M., Jr.
Louisiana State Dept. of Education, Baton Rouge.
Sponsoring Agency: Office of Special Education and Rehabilitative Services (ED), Washington, DC.
1985; 37p.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Guides—Classroom—Teacher (052)
Target Audience: Teachers; Practitioners
Major Descriptors: *Computer Literacy; *Curriculum Development; *Microcomputers; *Programing Languages; *Special Education

Designed to provide Louisiana special educators with the background information they need to develop a computer literacy curriculum for use with their students, this document is divided into four training modules: (1) Introduction to Computer Literacy and Computer History; (2) Introduction to Computer Hardware and Software; (3) Introduction to Computer Programming with BASIC; and (4) Evaluation of Application Software. To assist teachers in identifying their skills development, lists of objectives and related activities introduce each module. Modules 1 and 2 present information on the concept of computer literacy, the history of computers and computer use, computer hardware and software, computer assisted instruction (CAI), and programming languages. Module 3 provides step-by-step instructions for writing a computer program in BASIC and addresses the nature of computer programing as a problem-solving procedure. Module 4 presents suggestions for evaluating computer software and identifies three basic stages in an evaluation: the classification, description, and observation stages. Finally, a chart is included which lists the characteristics of five types of CAI software—drill and practice, tutorial, testing, simulation, and dialog. (JB)

ED260526
The Use of Computers and Video Games in Brain Damage Therapy.
Lorimer, David
1985; 27p.
EDRS Price—MF01/PC02 Plus Postage.
Document Type: Guides—Non-classroom (055)
Major Descriptors: *Adventitious Impairments; *Computer Assisted Instruction; *Computer Software; *Neurological Impairments; *Rehabilitation

The use of computer assisted therapy (CAT) in the rehabilitation of individuals with brain damage is examined. Hardware considerations are explored, and the variety of software programs available for brain injury rehabilitation is discussed. Structured testing and treatment programs in time measurement, memory, and direction finding are described, as well as such unstructured programs as games, puzzles, and educational routines. The use of video games to heighten interest and motivation is noted. Two case studies are offered which compare conventional therapy and CAT for head injury victims. The paper concludes with a brief discussion of problems in rehabilitation of persons with head injuries, including resistance of insurance companies to pay for computer equipment. (CL)

ED269916
The Motor Specialist and Classroom Teacher Team with Logo.
Montague, Elaine C.
1986; 24p. Paper presented at the Annual Convention of the Council for Exceptional Children (64th, New Orleans, LA, March 31-April 4, 1986).

EDRS Price—MF01/PC01 Plus Postage.
Document Type: Speeches/Meeting Papers (150); Guides—Classroom—Teacher (052)
Target Audience: Practitioners
Major Descriptors: *Computer Assisted Instruction; *Disabilities; *Motor Development; *Occupational Therapy; *Spatial Ability

The paper describes a Logo environment designed by an occupational therapist to help 10 disabled students (6-9 years old) explore relative distance, directionality, and spatial relations. The program's goals include enhancing students' language development, planning skills, decision making, risk taking, and problem solving. Logo is briefly reviewed, and procedures for implementing the specific Logo environment noted. Two programs featured (1) abstract on-screen problem solving preceded by concrete physical activities and (2) a sequence of mazes. Teacher and student evaluation data are noted and guidelines are presented for replicating this type of project. (CL)

ED261853
The Potential of Computer-Based Expert Systems for Special Educators in Rural Settings.
Parry, James D.; Ferrara, Joseph M.
Utah State Univ., Logan.
Sponsoring Agency: Office of Special Education and Rehabilitative Services (ED), Washington, DC.
[1984]; 13p.
EDRS Price—MF01/PC01 Plus Postage. Document Type: Guides—Non-classroom (055); Reports—Descriptive (141)
Target Audience: Practitioners; Researchers
Major Descriptors: *Computer Managed Instruction; *Computer Software; *Rural Education; *Special Education; *Technological Advancement

Knowledge-based expert computer systems are addressing issues relevant to all special educators, but are particularly relevant in rural settings where human experts are less available because of distance and cost. An expert system is an application of artificial intelligence (AI) that typically engages the user in a dialogue resembling the conversation a person might have with an expert consultant. The expert systems could serve as consultants to the educator in addressing issues such as identification, diagnosis, and remediation of problems presented by special education students. A number of computer systems are available or under development that may be of immediate value to rural educators. One such system is the Buggy program which identifies a student's arithmetic misconceptions by analyzing error patterns from test problems worked by the student. Several prototype programs are being developed by the staff of the Special Education AI Project at Utah State University to test the feasibility of using expert systems to solve problems in special education. For example, two CLAS.LD systems provide second opinions regarding the accuracy of the "learning disabled" classification. To prepare themselves to capitalize on the advantages of new technologies such as expert systems, educators in rural settings can develop their technological literacy. (JHZ)

ED267539
Microcomputer Usage for Data Based Psychomotor Performance Measures in Adapted Physical Education.
Powers, P. J.
Montana Univ., Missoula.
Sponsoring Agency: Office of Special Education and Rehabilitative Services (ED), Washington, DC. Div. of Personnel Preparation.
1985; 11p. Paper presented at the Northern Rocky Mountain Education Research Symposia "A Data Based Approach to the Psychomotor Development of Profoundly/Severely Handicapped Children Preschool through Secondary Levels" (Jackson, WY, October 10-12 , 1985).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Reports—Descriptive (141)
Major Descriptors: *Adapted Physical Education; *Computer Assisted Instruction; *Curriculum Development; *Physical Education; *Severe Disabilities

The paper describes Project RISPE (Rural/Remote Interdisciplinary Special Physical Education) and its data-based psychomotor curriculum for profoundly/severely handicapped children ages 0-21. The curriculum, divided into five diagnostic/prescriptive areas (placement, baseline, instruction, post-test, and maintenance), includes over 300 specific performance objectives. The computerized program for the data management system includes both descriptive and statistical records. Suggestions are offered for helping adapted physical education educators to integrate the computer into their psychomotor or sport programs for handicapped children by informally familiarizing them with computers. (CL)

ED269907
Personal Perspectives on the Importance of the Response.
Rettig, Michael
1986; 16p. Paper presented at the Annual Convention of the Council for Exceptional Children (64th, New Orleans, LA, March 31-April 4, 1986).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Opinion Papers (120); Speeches/Meeting Papers (150)
Target Audience: Practitioners
Major Descriptors: *Computers; *Computer Software; *Disabilities; *Microcomputers

The paper examines the way preschool children with handicaps interact with and make their response to computer programs, suggesting that the most important factor ensuring successful computer use is finding the most appropriate method of computer access. Difficulties with software programs are noted, including problems with scanning. It is suggested that some children do not possess the required ability to make one-to-one correspondence. In addition, the variety of software programs calls for generalization, a skill lacking in many young handicapped children. Difficulties in hardware configurations are also reviewed. Possible adaptations, such as keyboard overlays and expanded keyboards, are considered. Adaptations to paddles and joysticks are described. The potential use of touch screens as response modes is emphasized, as is the need for determining a child's ability to access the computer system. (CL)

ED265706
Computer-Assisted Instruction: The Microcomputer as an Electronic Teacher's Aide.
Stowitschek, Carole
1985; 9p. Paper presented at the Annual National Rural Special Education Conference (5th, Bellingham, WA, March 19-22, 1985).
EDRS Price—MF01/PC01 Plus Postage.
Document Type: Speeches/Meeting Papers (150); Reports—Descriptive (141)
Major Descriptors: *Computer Assisted Instruction; *Computer Managed Instruction; *Disabilities; *Models

The paper examines the application of IMS—Instruction Management Systems—on classroom instruction with exceptional students. IMS, a computer-based material generation and record management software program which has been field tested in secondary school resource rooms in Utah and Idaho, is a unique model in that it includes aspects of both computer assisted instruction and computer managed instruction. Each of the major components of IMS is described: sequenced objectives, placement tests, worksheets (instruction, practice, mastery, and review worksheets), student progress records, and accompanying teacher manual. So far, teacher reactions to the product have been favorable, and it is possible that IMS may soon become a useful "electronic aide" in the classroom. (CL)

ED270909
Training of Trainers: Leadership Training for Administrators of Special Education in Emerging Technology.
Vasquez, Mary Britt; And Others
Special Education Resource Network, Sacramento, CA. Resource Service Center.
Sponsoring Agency: California State Dept. of Education. Sacramento. Office of Special Education.
1985; 301p. Also funded by a Federal VI-D Personnel Development Grant. Presentation at the Annual Convention of the Council for Exceptional Children was based on the document (64th, New Orleans, LA, March 31-April 4, 1986). For related documents, see ED 270 907-908.
Available from: Special Education Resource Network/Resource Service Center, 650 University Ave. #201, Sacramento, CA 95825 ($30.00).
EDRS Price—MF01/PC13 Plus Postage.
Document Type: Speeches/Meeting Papers (150); Guides—Non-classroom (055)
Target Audience: Practitioners; Administrators
Major Descriptors: *Administrator Role; *Computer Managed Instruction; *Databases; *Disabilities; *Management Information Systems; *Microcomputers

Developed to fill a gap in preservice and inservice training, the materials focus on training special education administrators and program specialists to use computers in program management. Materials include packets to be reproduced for participants as well as outlines, transparency masters, lists of audiovisual materials, and scripts for trainers. Modules touch on the following topics, providing participant and trainer information for each: software, systems, and hardware; microcomputer word processing; administrative planning; databases; microcomputer spreadsheet systems; programmed administrative applications—Individualized Education Program; and evaluation processes. (CL)

AUTHOR INDEX

Amburgey, Valeria 11
Ankney, Barry 79
Archibald, Georgia 51

Baggett, Patricia 36
Balajthy. Ernest 63
Ball, Stanley 16
Baltra, Armando 49
Bangert-Drowns, Robert L. 3
Bank, Adrianne 32
Barclay, William L. 65
Baskin, Linda 16
Batey, Anne 66
Bebout, Harriett C. 60
Berger, Carl F. 42
Bleuer, Jeanne 30
Borst, Richard Alan 66
Bozeman, William 46
Brown, Herman D. 71
Brown, John F. 45
Browning, Philip 80
Browning, Ruth 72
Bruce, Bertram C. 52
Buccino, Alphonse 66

Canelos, James 37
Carey, Doris 16
Carey, Regan 16
Carnew, Frederick I. 37
Carnine, Doug 33
Caulum, David 31
Charney, Davida H. 38
Clark, Richard E. 38
Clark, W. Bruce 37
Cline, Ann Willett 80
Cobern, William W. 43
Coe, Merilyn 33, 35
Coffin, Gregory C. 33
Collins, Angelo 67
Combs, Martha 52
Cooney, John B. 61
Cooper, Mary E. 4
Cox, Ruth 49
Cuneo, Diane O. 67

Dalton, David W. 38, 60
Daiute, Colette 53
Daniels, Dale 72
Daugherty, Thomas 3
Davis, Barbara Baldwin 48
Davis, Bill 80
Deasy, Richard J. 3
de Bernard, Ann Evans 81
Deck, Dennis 35
Demmon-Berger, Debbie 4
Deshler, David 13
Dobrin, David N. 54
Dockterman, David 70
Drasgow, Fritz 43
Dudley-Marling, Curt 30
Duelm, Brian 75
Duffy, Thomas 39, 63
Dunn, Saundra 54
Durbin, Sandra 72

Edeburn, Carl E. 64
Ehrenfeucht, Andrzej 36
Elias, Barbara P. 61
Ellis, James D. 67
Evans, Robert J. 34

Feer, Michael 81
Ferber, Gloria P. 81
Ferrara, Joseph M. 82, 84
Fick, Landis F. 82
Fisher, Kathleen M. 14
Florio-Ruane, Susan 54
Friesen, Chuck 57
Fullilove, Robert E., III 25

Galen, Harlene 20
Gay, Geraldine 13
Geigel, Joan 68
Gerlach, Vernon S. 4
Gleason, Gerald T. 4
Gore, Dolores 54
Gray, Peter J. 27, 28

Hall, Carol S. 21
Hannah, Larry 24
Hannafin, Michael J. 38, 39
Hasselbring, Ted 40, 69
Helm, Virginia M. 5
Henney, Maribeth 64
Heuston, Dustin H. 6, 14
Hierstein, William J. 46
Hilgenberg, Gene 72
Hill, T. Susan 4
Hitchcock, Richard B. 55
Hofmeister, Alan M. 14, 82
Holter, Mary Patricia 77
Hurth, Joicey 82
Hurwitz, Dick 34

Irving, Jan 73

Johnson, Carmen 77

Kimball, Richard L. 58
Kittell, Linda 73
Klier, Betje 12
Kozubal, Diane K. 40
Krull, Robert 6
Kuerbis, Paul J. 67
Kulik, Chen Lin C. 78
Kuschner, David 40

Lambert, Roger 31
Lavin, Richard 46
LeBlanc, Patrice 21
LeCroy, Barbara 6
Leonard, Rex 6
Leonard, Stuart 38
Levin, James A. 70
Levin, Kathy M. 65
Lewis, Mark A. 61
Lipson, Joseph I. 14
Lopez, Antonio M., Jr. 83
Lorimer, David 83
Loucks-Horsley, Susan 41
Lough, Tom 58
Louie, Steven 41

McArthur, David L. 43
McCall, Cecelia 64
McDermott, Cecil W. 46
MacDonald, Joseph P. 12
McKibbin, Michael D. 45
McManus, Jack 7
Majsterek, David 7
Mandinach, Ellen B. 58
Marcus, Stephen 55
Marrapodi, Maryann 22
Masat[illegible]an 61
Mokr[illegible]anice R. 68
Mont[illegible]gue, Elaine C. 83
Morris[illegible]n, Gary R. 34
Moursund, David 8, 18
Murphy, Ann 69
Mylona, Martha D. 22

Newton, Sandra S. 55
Nickerson, Raymond S. 78

Oates, William R. 56
Olivier, Terry A. 11
Olivier, William P. 74
Owston, Ronald D. 30

Parker, Robert 74
Parry, James D. 84
Parson, Gail 56
Parsons, Charles K. 43
Phillips, Richard 22
Pierce, W. Lee 78
Pittelman, Susan D. 65
Pitts, Ilse M. 74
Powers, P. J. 84
Putnam, A. R. 75

Rand, David 58
Reder, Lynne M. 38
Reed, Timothy 4
Remp, Ann M. 48
Rettig, Michael 85
Rieber, Lloyd P. 59
Rieck, Donald A. 36
Robbat, Richard J. 9
Robinson, Brent 56
Rodriguez, Irene 23
Rogers, Everett M. 9
Rolley, Martha 35
Rosenfeld, Vila M. 75
Ross, Steven M. 34
Roth, Gene L. 75
Russ, Michael 70

Sanders, Jo Suchat 26
Sands, James 74
Schubert, Jane G. 26
Schultz, Karen A. 62
Seymour, Sherrie L. 10
Sherwood, Robert D. 10, 69
Simonson, Michael R. 41
Smith, Alan D. 71
Snyder, Douglas 80
Snyder, Tom 70
Stasz, Cathleen 24
Stemmer, Paul M. 42
Stennett, R. G. 10
Stowitschek, Carole 85
Strand, Elizabeth 59
Streibel, Michael J. 11

Tesolowski, Dennis G. 75
Tucker, Nancy G. 23

Vale, C. David 44
Van Dusseldorp, Ralph 13
van Lieshout, Ernest C. D. M. 62
Vasquez, Mary Britt 85

Walczak, Joseph 73
Walz, Garry R. 30
Warwood, Byrdeen 42
Weiss, David J. 44
Williams, Richard C. 32
Winkler, John D. 24

Zide, Michele Moran 21

ERIC® DOCUMENT REPRODUCTION SERVICE
3900 WHEELER AVE ALEXANDRIA, VA 22304-6409 1-800-227 3742
OPERATED BY
COMPUTER MICROFILM CORP.
703-823-0500
EDRS

IMPORTANT INSTRUCTIONS TO COMPLETE THIS ORDER FORM

- **Order by 6 digit ED number**
- **Enter unit price**
- **Specify either Microfiche (MF) or Paper Copy (PC)**
- **Include shipping charges**

ED NUMBER	NO. OF PAGES	NO. OF COPIES		UNIT PRICE	EXTENDED UNIT PRICE
		MF	PC		
TOTAL NO. OF PAGES				SUBTOTAL	
				VA RESIDENTS ADD 4.5% SALES TAX	
				SHIPPING CHARGES	
				TOTAL COST	

UNIT PRICE SCHEDULE

MICROFICHE (MF)			PAPER COPY (PC)		
NUMBER FICHE EACH ED #	PRICE CODE	Price	NUMBER PAGES EACH ED #	PRICE CODE	Price
1 to 5 (up to 480 pages)	MFO1	$.82	1 to 25	PCO1	$1.94
Each Additional microfiche (additional 96 pages)		.16	Each additional 25 pages		$1.94

CHARTS FOR DETERMINING SHIPPING CHARGES

1st CLASS POSTAGE FOR						
1-7 Microfiche ONLY $0.22	8-19 Microfiche ONLY $0.39	20-30 Microfiche ONLY $0.56	31-42 Microfiche ONLY $0.73	43-54 Microfiche ONLY $0.90	55-67 Microfiche ONLY $1.07	68-80 Microfiche ONLY $1.24

UNITED PARCEL SERVICE CHARGES FOR CONTINENTAL U.S. SHIPMENTS ONLY

1 lb. 81-160 MF or 1-75 PC PAGES Not to Exceed $1.91	2 lbs. 161-330 MF or 76-150 PC PAGES Not to Exceed $2.37	3 lbs. 331-500 MF or 151-225 PC PAGES Not to Exceed $2.78	4 lbs. 501-670 MF or 226-300 PC PAGES Not to Exceed $3.20	5 lbs. 671-840 MF or 301-375 PC PAGES Not to Exceed $3.54	6 lbs. 841-1010 MF or 376-450 PC PAGES Not to Exceed $3.88	7 lbs. 1011-1180 MF or 451-525 PC PAGES Not to Exceed $4.28	8 to 10 lbs. 1181-1690 MF 526-750 PC PAGES Not to Exceed $4.70-$5.53

NOTE—Orders for 81 or more microfiche and all orders for paper copies (PC) will be shipped via United Parcel Service unless otherwise instructed.

PAYMENTS: You may pay by

1. Enclosing CHECK or MONEY ORDER with your order. Foreign customer checks must be drawn on a U.S. bank.
2. Charge to a MASTERCARD or VISA account. Enter account number, card expiration date and signature. (EDRS also accepts telephone orders when charged to a MasterCard or VISA account.)
3. PURCHASE ORDERS: U.S customers may enclose an authorized original purchase order. No purchase orders are accepted from foreign customers.
4. Charge to a DEPOSIT ACCOUNT. Enter deposit account number and sign order form.

PLEASE INDICATE METHOD OF PAYMENT AND ENTER REQUIRED INFORMATION.

MasterCard
WE HONOR BOTH
VISA

☐ Check or Money Order ☐ Purchase Order (ATTACH ORIGINAL PURCHASE ORDER)

☐ MasterCard ☐ VISA

Account Number _____ Expiration Date _____

Signature _____

☐ Deposit Account Number _____ _____

Signature _____ _____

ENTER "SHIP TO" ADDRESS _____

_____

_____

CALL TOLL FREE 1-800-227-ERIC (3742) TO PLACE PHONE ORDERS OR FOR CUSTOMER ASSISTANCE

EFFECTIVE FEB. 1, 1988