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ABSTRACT

Noting that recent developments in computer technology facilitate the integration of media in literacy development, this paper reviews 18 items of courseware designed to promote literacy development within a whole language framework. The reviews are divided into four sections dealing with the following topics: (1) idea processors and the contributions of graphic organizers to information processing in the content areas; (2) media integration systems and the capacity to synthesize interdisciplinary content; (3) desktop publishing as a vehicle for producing sophisticated report formats; and (4) courseware in reading and literature designed to promote integrated literacy development. The paper concludes that these programs are useful both across the curriculum to facilitate information processing and in conjunction with thematic, literature-based, or content area units of study to enhance higher-order thinking. (Thirteen references are attached.) (RS)

Integrated Literacy Development and Computer-Based Instruction

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Running Head: Integrated Literacy Development and CBI

Integrated Literacy Development and Computer-Based Instruction

Introduction

Recent developments in computer technology facilitate the integration of media in literacy development. Currently, more media management systems are available to accelerate linkages among media: text, graphics, audio, video, and interactive programs. These programs have the potential of expediting literacy integration within meaningful content-area contexts. The challenge to teachers is to determine how computer-based instruction can be used in conjunction with existing literacy-related curricula as part of the regular program rather than as an add-on.

Current research on literacy development seems to support the use of strategies which include active engagement of students in meaningful experiences of thinking, listening, discussing, reading, and writing such as: a) the immersion of students in language through reading, writing, and being read to; b) the employment of literature-based strategic reading, using authentic texts for authentic purposes; c) the integration of reading and writing; d) the development of thematic units across the curriculum (Goodman, 1986; Holdaway, 1979; Atwerger, Edelsky, and Flores, 1987; and Heald-Taylor, 1989); and e) the utilization of hypermedia in literacy development (Roos, 1991). Similarly, Pappas (1990) suggested that an integrated language orientation is based on three interrelated principles: "(a) Children are active, constructive learners, (b) Language is used for many social purposes that are expressed by many language patterns, and (c) Knowledge is organized and constructed by individual learners through social interaction" (p. 8).

Pappas (1990) explained that thematic units reflect patterns of thinking, goals, and concepts common to bodies of knowledge. They link together

interdisciplinary content and as such are effective structures of wholistic learning. Focusing in on the step by step procedures for developing thematic units enhanced by computer technology, Willing and Girard (1990) gave suggestions for infusing computer-based instruction into the content areas organized within a whole language framework. They proposed that one begin by identifying a topic for a thematic unit and then develop an interdisciplinary thematic web on that topic. Next, a courseware web is superimposed on the thematic web. Finally, a web of possible learning activities is added.

Horney, Zeitz and Anderson-Inman (1991) discussed electronic outlining and its facility in promoting thinking and writing across the curriculum. Electronic outlining is "an easy way to empower students through the use of technology. Electronic outliners provide students with a dynamic medium for recording and organizing their ideas prior to writing. As such they enhance their abilities to communicate effectively (p. 33)."

Boeschen (1991) noted that electronic clustering graphically reflects student's higher-order thinking skills and problem solving patterns as they brainstorm and map their solutions. The product becomes a knowledge map. (See MINDMAP (W. J. Bradford Publishers). Information can be processed in several different formats: charts, tables, graphs, explanatory text, sound from newscasts videodisc clips. Similarly, Cronin, Meadows, and Sinatra (1990) explained that semantic mapping is a practical way to apply schema theory in the classroom. They discussed some benefits resulting from this process:

1. Computers facilitated the mapping of ideas.
2. Computer-enhanced mapping provided a model for identifying major, subordinate, and explicit ideas in their text assignments.
3. By merging mapping and writing across the curriculum, district teachers deminstarted to their students how to embed facts

> within a meaningful whole and how to use writing and computers as important tools in all subjects.

Clark (1991) emphasized that visual organizers:

> "simplify the thinking process, allowing access and understanding on the part of different students with different attitudes and abilities. They stabilize (or freeze) parts of the thinking process, allowing all students a chance to observe and criticize the process itself. They provide a social context for the most private of our thoughts, asking us to explain how we see what we see and also compare our vision to the vision of others (p. 534).

This author has reviewed courseware in the language arts in terms of these emphases. Specifically, it is the purpose of this paper to discuss courseware designed to promote literacy development within a whole language framework. The following discussion is based on four types of computer enhanced instruction: (a) idea processors and the contributions of graphic organizers to information processing in the content areas, (b) media integration systems and their capacity to synthesize interdisciplinary content, (c) desktop publishing a vehicle for producing sophisticated report formats, and (d) courseware in reading and literature designed to promote integrated literacy development.

Courseware and Integrated Literacy Development

Graphic Organizers and Idea Processing

MINDMAP (MM) (W. K. Bradford Pub. Co., MAC, 1024 K, Hypercard 2.0 v2)designed for grades 6-12 is a multimedia management system based on the writing process. It inspires thinking and problem solving in the content areas. MM uses an electronic clustering strategy which provides a structure for the development of the following: (a) problem solving, (b) higher order thinking skills, (c) writing in multimedia presentations, and (d) expressive speech and writing. Teachers can use MM to create stacks for classroom use. Through it

they can create a rich environment for collaborative learning in which students choose to develop media in their preferred learning style.

MM is a vehicle for integrating media across the curriculum. It is a structure through which students can create multimedia reports and presentations through the processes of brainstorming ideas, linking ideas, and enhancing their ideas by adding words, pictures, sounds, and still and motion video. Its Dial-a-Link feature enables students to link ideas to any application on their Macintosch computer. Likewise, files can be exported to THINK AND WRITE, by the same publisher. Images and sounds from video disks or CDs can be linked and a microphone can used to record and link their digitized speech. For example, a single mouse click on a brainstormed idea reveals the information screens that support the hypothesis of that idea. Clusters can be associated and thereby add more credibility to the hypothesis. Reports can be printed in outline form or with full text.

THE SEQUENCER (Teacher Support Software, Apple 11 Series) designed for grades 2-6, will help your students to summarize stories and to put the events in sequential order. It is a teacher/student tool which: a) encourages the retelling of stories, b) models sequential writing, c) offers three summarizing and sequence lessons, d) enables students to summarize stories, books, or units of study, and e) provides a management system. THE SEQUENCER supports reading and writing across the curriculum. Students can create open ended maps resulting from brainstorming. Prompts are provided to assist students in sequencing ideas and in recalling and organizing main events.

THE SEMANTIC MAPPER (Teacher Support Software, Apple 11 Series) designed for grades 3-6 is a teacher/student tool which allows one to create maps, explore conceptual words in any content area, and organize thoughts for

writing. It promotes higher order thinking skills, includes a management system, provides maps from basal stories and reinforces words from basal stories.

THE LITERARY MAPPER (Teacher Support Software, Apple 11 Series) designed for grades K-3, 4-6. After reading a book, students can explore character, setting, and plot. This program provides a database rich in language about these elements of story structure. Story maps are provided for six books at each level. These ready made ones may be used or one can create some for books being read.

Media Integration Systems and Interdisciplinary Content

HYPERSTUDIO 2.1 (Roger Wagner, Apple 11 GS) designed for grade 1-Adult, makes hypermedia (text, graphics, sound, animation, interactive video, and telecomputing) available. It supports Edmark's TOUCH WINDOW, Computer Eyes's VIDEO DIGITIZER, Apple II's VIDEO OVERLAY CARD, and Pioneer's 2200, 4200,8000 Laser Disk Player. Version 2.1 includes improved painting and editing tools, as well as four disks of clip art accessories. Advanced features comprise availability of additional hyperstacks on online services such as America Online, CompuServe, Genie, and from magazines such as Stack Central and the Hyperlearning Forum. This tool enables teachers and students to create multimedia data bases/stacks in the content areas. It empowers students to hear their own voices and to incorporate text, graphics, sound, animation, interactive video and telecomputing in their projects.

LINKWAY (IBM,MS-DOS, 512K) designed for grade 1-adult, makes hypermedia (text, graphics, music, speech, animation, interactive video, telecomputing,and more) available in associative, nonlinear ways. It allows teachers and students to create their own multimedia presentations combining text, graphics, picture

images, voice and motion video. LINKWAY supports an IBM Speech Adapter, IBM Music Feature and a video disc player.

SLIDE SHOP (Scholastic, Inc., Apple 11 Series, MS-DOS) designed for grades 4-12, is versatile, multimedia courseware which enables teachers to create interactive computer "slide" presentations. With it, students can create audiovisual reports, animated greeting cards, or letters that friends can run/self boot on their own computers. This program allows students to design their show, choosing from a variety of templates, backgrounds, fonts, and clip art. Color, sound, music, and special visual effects can be added. Screens can be printed onto overhead transparencies and printouts of screens can be made in color or black and white. Presentations can be captured on videotape and title sequences can be spliced/overlaid onto full-motion video by Apple 11 Video Overlay Card.

Desktop Publishing Across the Curriculum

THE CHILDREN'S WRITING AND PUBLISHING CENTER (CWPC) (Learning Company, Apple II, IBM, Tandy) is a popular and effective desktop publishing tool for students of ages eight and up. This user friendly program makes the process of writing fun and stimulates creativity. It combines the features of word processing, graphic selection and page design to produce reports, letters, stories, and two-column newspaper formats. The CWPC's 5.25" version has a double-sided program disk, a double-sided picture disk, a preformatted storage disk, a User's Guide and a Ready Reference Card. Teaching suggestions, black line masters, and sample files are provided. It has excellent on-screen prompts, very informative help screens, and an icon driven menu. A comprehensive teacher's guide is available with on-line and off-line activities to enhance instruction.

Heading/Banner. After a document type is chosen (report, letter, newsletter, stories and more), one decides on a layout style, one with or without a heading. Next if one chooses, a graphic is selected and placed within the heading. Then, a font style is chosen from one of the eight displayed in the menu. Finally, as the heading is typed it automatically wraps around the graphic.

Body. There are 40 characters per line in a one-column document and 80 in a two-column document. Procedures for placing graphics and text are the same as those used in the heading; however, it is suggested that text be inserted first. As graphics are inserted, text is automatically reformatted.

Graphics. Over 150 graphics are included that can be easily integrated with the text. Others can be imported from compatible Dos 3.3 formats such as: 1) Art Gallery 1 & 11 (Unison World, Inc.) 2) Graphics Library (Big Red Computer Club, 23 disks) 3) Graphics Scrapbook 1, 2, & 3 (Epyx) 4) Miniplx Disk 1 & 2 (Beagle Brothers), 5) Print Shop Companion (Broderbund Software, Dos 3.3 version), 6) Print Shop Graphics Library Holiday Edition, Broderbund Software, Dos 3.3 version, and 7) Steel Publishing (6 picture disks). For example, one might boot the Print Shop program disk, load a picture from the Print Shop Graphics Library in the graphic editor and save it to a formatted Dos 3.3 disk, a process that makes it a compatible graphic. Also, any single high resolution graphic image can be converted to a format usable by the CWPC using the "capturing a graphic function of the Graphics Editor+ found on the Print Shop Companion Program.

Revision/Editing. This software has capability to insert, move, copy, center, delete text in the body as well as to flip graphics. Parts may be moved to another document as well.

Appropriateness and Educational Value. Students can use the CWPC to write/print: reports, collaborative or individual compositions, newsletters, friendly letters, party invitations, and fancy awards. This versatile program can be used across the curriculum in a variety of ways. The manual suggests a number of story starter ideas/questions as prewriting strategies for the different genre presented. Models exemplify the structure of a number of expository types.

SUCCESS WITH WRITING (Scholastic, Apple 11 Series, MS-DOS) designed for grades 7-12, divides the writing process into four flexible modules: 1) Prewrite module helps students brainstorm and refine ideas, 2) Arrange/Outline Module stimulates students with questions to help organize and outline their ideas for different types of writing, 3) Compose/Draft Module provides a word processing feature, 4) Evaluate/Edit/Revise Module provides tools to help students evaluate the style, structure, spelling, and grammar. A text analyzer estimates the reading level of students' writing. This program is compatible with BANK STREET WRITER III, MULTISCRIBE, APPLEWORKS, and PFS: WRITE (128K)

THINK AND WRITE (William K. Bradford, Macintosh) designed for grades 7-12, is a text processing program designed for writing research papers. It helps to organize the writing process through the use of the note card, which can be ordered, opened, and closed readily. Further, students can generate multiple note cards, can label each note card for easy reference, and can move material from one card to another. Note cards can be used to make an outline of their project. With a single command, note cards can be merged and the text integrated within a document. In printing, one has a choice of font style and size. The ELECTRONIC HANDBOOK (Technology Training Associates), a style/usage guide, can be used with this program.

PRIMARY EDITOR PLUS (IBM, PS/2, IBM Speech Adapter) designed for grades K-8, is a flexible entry level word processor that includes a spelling checker; 40-80-column mode; eight-color selection; paragraph reflow; and mark, move and copy functions. Other features include a print editor which allows students to create/draw using the keyboard or mouse, a banner maker that prints signs in three different letter sizes, online instructional tutorials for the text and picture editor, text-to-speech voice capability, and networkability.

STORY STARTERS: SOCIAL STUDIES (SS:SS) (Pelican Software is a part of a Creative Writing Series designed to stimulate writing across the curriculum in grades 2-8. This versatile text and graphic processor, developed for the Apple II Series, contains two disks: 1) program and background scenes and 2) clip art. With this program, students can combine full-screen story processing and full-screen graphic production as they choose colorful backgrounds and clip art and manipulate these to create scenes for a variety of formats: reports, posters, mini-books, big books, coloring books, comic books, dioramas, bulletin board displays, and more.

SS.SS can be used across the curriculum in an open-ended mode to supports a wide range of learning styles, ability levels, and teaching styles. Teachers who use it with thematic, literature-based, or content areas units, find that it is a vehicle for wholistic learning, a means for connecting writing, reading, listening, and thinking, as well as an instrument for collaborative communication. Too, SS.SS might readily be used in conjunction with an inquiry approach to social studies education, characterized by investigative processes such as: analyzing, classifying, comparing, contrasting, defining, describing, generalizing, inferring, and integrating.

The text/graphic processing features of SS.SS include the following functions: delete, insert, wordwrap, varied font styles and sizes, flip a graphic, hear a word, spell a word, edit speech, and view a finished picture while writing a story. Printing can be done in one of seven unique sizes, ranging from miniature size to Big Books, in color or in black and white. Stimulating graphics, talking menus, a text processor, and big fonts for the visually impaired make this program particularly appropriate for students with learning disabilities and for ESL students. SS.SS interfaces with an Adaptive Firmware Card, a Unicorn Board, or a Single Switch Device for students with physical disabilities.

SS.SS is an effective composing and graphic selection tool which can be used across the curriculum to meet the needs of a range of students, particularly special students. With this easy-to-use, versatile program, students have fun learning and take pride in high quality printouts.

Reading and Literature: Integrated Literacy Development

READING REALITIES: ELEMENTARY SERIES (RR:ES), Teacher Support Software (TSS), Apple II Series, 128K; MS-DOS 512K) is designed for grades 2-6, the regular classroom, Chapter 1, Special Education, ESL, or At-Risk Students. The objectives of Reading Realities: Elementary Series (RR:ES) are: (1) to help students in grades 2-6 to develop an interest in reading and writing, (2) to improve reading comprehension, rate of reading, and writing development, and (3) to provide interesting materials to encourage students to think about themselves in the real world.

RR:ES is an interactive, whole language-based program which addresses literacy development in the context of three thematic areas: (1) school issues

(six disks), (2) family issues (six disks), and (3) personal issues (six disks). Each of these three packages may be purchased for $169.95, all three for $489.95, or a network version for $849.75. For speech capability with the Apple 11 Series, use a Slotbuster or Doubletalk speech card, with IBM use MCGA.

RR:ES supports an integrated, socially-engaging approach to literacy development. This program is effective in improving strategic reading as well as in serving as a vehicle for problem resolution within a genuine context. Some topics included in this program are: "I Have a Learning Problem" "I Want my Privacy", and "My Dreams Scare Me." Each theme has 15 stories which engage students as they consider the issues presented: issues which they can readily relate to in daily life.

TSS states that a survey of 1000 elementary students nationwide was conducted to identify issues of concern to elementary students. Topics were selected based on students' most frequently cited real-life concerns. Stories were written quoting students verbatim. Subsequently, students' reactions were sought and used in the revisions. As a result RR:ES is "kid's talk" written down. Its management system is comprehensive and can be very useful to teachers.

Reading phase. The student selects a story and may choose one of several options: reading words, phrases or the whole screen with or without speech. Should the student choose whole screen, the reading rate (words per minute) is given after whole screen reading. Modes can be changed by pressing the space bar and then C. During "Read Words," students can view vocabulary by pressing V. For example, while reading a full screen, a student might activate "Words" and consult a vocabulary definition in this mode. A window appears with information about each word.

The reading menu choice "preview vocabulary," allows one to view some or all story vocabulary as needed. Information about each word (part of speech, definition, sentence, antonym/synonym) is given. Students may elect to review these words with or without speech.

Postreading activities. Postreading activities include the following: multiple choice questions, cloze, discussion questions, creative questions, reread story, read another story, save, and print options. Students are given two types of discussion questions: analytical and creative ones. Five analytical questions are provided which require the student to compare and contrast predictions made about the passage with the text and to analyze the text. Next, three creative questions are supplied to encourage students to respond personally to the passage. Discussion questions stimulate students to prepare personal responses. These questions and prepared notes might be used later in cooperative learning activities involving issue-related discussion. Additionally, open-ended writing exercises might be used in conjunction with this program.

Management system. The management system is designed to show all facets of student and class progress. Individual or class profiles are available to view/print. These profiles include: scores on multiple choice items represented in percent correct, the number of correct answers given to questions at the literal and inferential levels, the number of answers to discussion questions and creative questions. Cloze test scores are converted to percent scores and the related functional reading level (independent, instructional, or frustration) is identified for each student. Other functions include: to view/print stories, questions, vocabulary, and writing.

WRITE ON: PRIMARY COLLECTION (Humanities software, Apple II Series, Mac, MS-DOS) designed for grades K-4, is a collection of 27 programs, each available

for separate purchase. Using popular children's books and poems as motivators of student writing, this program is compatible with the word processors: Scholastic's PFS: WRITE, BANK STREET WRITER, and PRIMARY EDITOR PLUS. WRITE-ON is a literature-based approach to writing, in which students read books or poems and then write about what they have read, revise and edit their writing, and publish their ideas. "Great Wild Imaginings," for example, uses WHERE THE WILD THINGS ARE and other popular monster stories to stimulate students to write about their own monsters. Other choices on the menu are: real versus imaginary, similes, couplets, effective sentences and literary exaggeration. The collection is networkable and comes with full use license. WRITE ON ELEMENTARY COLLECTION and the WRITE ON INTERMEDIATE COLLECTION are available as well.

BOOKWHIZ (Educational Testing Service, Apple II Series) designed for grades 6-9, is an annotated database of about 1000 books designed to be used by students in book selection. The set consists of nine color-coded disks from which students might select in terms of book length, reading level, grade level, and gender of the main character. BOOKWHIZ searches the disk and indicates the number of books found meeting the desired book's specifications. A two-line teaser, a ten line annotation about the book, or the option to list additional related books is available.

ELECTRONIC BOOKSHELF (The Electronic Bookshelf, Inc., Apple II Series) designed for grades 3-12, contains multiple choice quizzes to test students comprehension of books and keeps a record of what books students have read and who has read them. Questions about books are randomly selected, thereby limiting the chances of two students getting the same questions on a book. Points are earned based on the difficulty of the book. Fifty volumes (15-26 titles) are now available. Teachers and students can create additional data disks with questions

related to books of their choosing. It is an excellent resource to stimulate students to read for pleasure.

EXPLORE A CLASSIC (William K. Bradford and Learningways, Apple II Series, MS-DOS) designed for Pre-K-3, is a colorful, animated software, allows the teacher to share classics with students in a number of ways. As a story teller, one might read the classic aloud as it appears on the screen. As a story maker, a student can move characters, backgrounds, text, and objects to create newscenes or reconstruct the original scenes. The activities option provides exercises that enhance comprehension. This program accommodates a range of reading styles and combines creativity with basic skill development. Illustrative titles are: STONE SOUP, THE PRINCESS AND THE PEA, and THE THREE LITTLE PIGS.

EXPLORE-A-STORY (William K. Bradford/D. C. Heath, Apple II Series) designed for students in grades K-5,gives students an opportunity to read or to hear read a story from this series. They are encouraged to modify existing scenes by adding, deleting, and moving characters, text, backgrounds, and objects. Twelve full-color story books accompany this program. Scenes from stories might be used to stimulate students to write imaginative stories/books of their own. These may be printed in black and white or in color. In addition, this program might also provide the structure for story retelling or story reconstruction.

Conclusion

Recent developments in computer technology facilitate the integration of media in literacy development. Courseware has been discussed which expedites the integration of listening, speaking, reading, and writing within meaningful content-area contexts. These programs are useful both across the curriculum to

facilitate information processing and in conjunction with thematic, literature-based, or content area units of study to enhance higher-order thinking.

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