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MICROCOMPUTER APPLICATIONS FOR CONTENT AREA VOCABULARY

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Microcomputers have become fixtures in most schools. It would be a rare elementary, middle, or high school which did not have a microcomputer lab, and many teachers now have at least one micro available in the classroom itself. With the proliferation of the microcomputer and its attendant software have come many potential uses in content areas (Blanchard & Mason, 1985). Vocabulary instruction is perhaps one of the most accessible and versatile areas in which the microcomputer can be a significant adjunct to content teaching.

Teaching Content Area Vocabulary

The key word in the sentence above is "adjunct." Unless a teacher is proficient in an authoring language such as Pilot or EZ-Learner, he or she is dependent on existing software. Preprogrammed software will not always fit a particular topic. A computer simulation such as Lemonade Stand may be useful in reinforcing concepts like assets and deficits (Balajthy, 1984), but the social studies teacher may not be able to find a simulation activity to fit a unit on the War of 1812, nor will the biology teacher be able to find a vocabulary program which neatly reinforces technical terms related to the study of genetics. Even if such programs existed, they would not "teach" by themselves.

In content areas, technical vocabulary is more than just "words" for which "definitions" must be learned. Whether it is a familiar word with a new meaning (such as culture in anthropology or biology) or a completely unfamiliar term (such as apogee, perigee or syzygy in astronomy), the words represent important concepts to be

mastered. Learning these terms and the concepts they represent requires many exposures in a variety of contexts (Beck & McKeown, 1983). Through reading, class lecture and discussion, experiments, problems, quizzes, and other kinds of exercises, students come to an understanding of new vocabulary. Effective vocabulary instruction helps students relate new words and concepts to their previous knowledge, develops elaborated understanding of those words and concepts, gets students actively involved in learning, and gives students strategies for independent vocabulary development (Carr & Wixson, 1986).

The initial responsibility for teaching remains with the teacher, but once vocabulary has been selected and presented to students in a manner consistent with Carr & Wixson's recommendations, there are three types of software packages which can provide additional reinforcing exposure and active student involvement. They are word processing programs, utility programs, and arcade-type games. The microcomputer can add to the variety of teaching and reinforcing activities available to the teacher; it can be used to provide written or "on screen" vocabulary exercises either for a whole class or for small groups and individual students who need extra reinforcement.

Types of Programs

Word processing. A teacher can use a word processing program such as Bank Street Writer (Broderbund) or FrEdwriter (Que Softswap Project) to create most of the same kinds of reinforcing activities which they might ordinarily have done by hand or typewriter. These exercises could be printed out for duplication and distribution in class, or they could be stored on disk so that students could retrieve them and work with them at the microcomputer. (Note: If this second option is chosen, the file or the disk should be "write-protected" so that students cannot inadvertently delete, alter, or otherwise spoil the exercise).

Matching activities, categorizing exercises, analogies, and quizzes can be quickly created at the computer, with the advantage of easy editing and revising available through word processing. Cloze passages can be quickly and accurately developed, and if the original text is stored intact,

different passages can be created by retrieving the original and deleting alternative words. Word processors can also be used in conjunction with utility programs to add text to word puzzles.

The teacher can reinforce context clues by giving students a list of words and then directing them to use the "find" command to locate them in text which has been entered in the word processor. As they see how the words are used in context, students can hypothesize the meaning of each and then check their guesses against the dictionary or against a glossary which has also been stored on disk. This kind of activity develops context and diction-ary skills which can be used independently, one of Carr & Wixson's criteria for effective instruction.

Utilities. Utilities are programs which allow the user to plug variables into a predetermined format. For instance, with Crossword Magic (L & S Computerware), the teacher can use selected vocabulary and definitions to create crossword puzzles. These puzzles then can be printed out for duplication or called up and solved at the computer. Other examples are MECC Teacher Utilities I (Minnesota Educational Computing Consortium), which has programs for crossword puzzles and word searches, and Magic Squares (Southern Software) which creates self-correcting matching exercises.

Because of their relatively structured formats, utilities such as these are not as versatile or as challenging to the student as the types of activities which teachers can design with a word processor. Many of them restrict the number of words and the length of the definition "clues" that can be used. They may accommodate single words only, so terms such as square root or science fiction will appear as single words if they are included. Some, such as the MECC Word Find Program, simply create a puzzle but do not allow word lists or clues to be included.

On the other hand, most utilities are quick and easy to use. They require only a word list and brief definitions which are entered into the computer; the program does the rest. Utilities also allow the teacher to store, edit, and delete word lists. Used judiciously, students are gener-ally enthusiastic about the "puzzle" format of the exercises

and the self-correcting features of most of them.

Games. Arcade-type games can only be used at the computer keyboard, but they can be highly motivating for many students, especially poor readers who may be "print-shy" and unreceptive to other types of reinforcement. Word Attack (Davidson & Associates) is an example of a program which offers a variety of activities and allows the teacher to enter selected vocabulary with the program editor. Students have the option of a word display, which shows each word with its definition and an example sentence, a multiple choice quiz, a sentence completion activity and the game in which the player must "shoot" the correct word before the time runs out.

Games are probably the most limited of the formats available for vocabulary activities; on the other hand, they may be the most appealing to certain students. Some programs come with pre-packaged word lists; unless the program allows the teacher to use the vocabulary he or she has selected, it will have little application in content areas.

WHY USE THE MICROCOMPUTER?

The microcomputer can speed up the creation of materials to be distributed to the whole class, but that is not their only value. Frequently, certain students may require more practice or differentiated practice in order to learn. Poorer readers may need additional reinforcement of terms which most students have learned through class discussion. Gifted students may enjoy the challenge of an analogy exercise which might be frustrating to others. Students with reading difficulties may find the computer less threatening that pencil-and-paper or textbook exercises. Students who have been absent or missed work may need review or make-up assignments.

In these instances the teacher can design vocabulary activities which can be completed at the computer, either in the classroom or the computer lab. Students can work at the computer either alone or in pairs. A single exercise can be edited into more than one version, so that it can be "personalized" for specific students. It would also be feasible for the classroom teacher to give a vocabulary list to a reading or resource teacher, who could then

design computer activities for those students receiving additional help.

Another advantage of "on-screen" vocabulary activities is the potential for giving students prompt feedback on their performance. Although not as fast as the immediate feedback of some programmed computer-assisted instruction, microcomputer vocabulary activities offer several correction-/feedback options. Arcade-type games do give immediate feedback, and puzzles such as crosswords and magic squares are self-correcting. Some software allows students to check their work immediately on-screen against an answer key stored on disk. If a printer is available, students may print their finished work for teacher correction, or print a copy and check against a key stored in a computer file. It would also be possible for students to store their work on disk for subsequent teacher review.

Consider as an example a sixth grade social studies teacher in a large northeastern middle school. She is one of a four-teacher team responsible for 120 students. As part of a unit on "society and culture," she is teaching a chapter on how people use the physical environment.

The teacher begins by developing a "word web" around three terms previously learned: "society", "basic needs", and "environment". They discuss how these concepts are related, with reference to their own severe winter climate. To this web she adds several other terms such as "family group", "cooperation", "customs", and "resources". Students copy the word web in their notebooks.

At this point she introduces the reading assignment and tells students to be especially alert for the terms they have discussed. As homework, she gives them a vocabulary worksheet she has developed on the word processor. The worksheet features clusters of five terms, four of which are related. A student is to cross out the unrelated word and choose one of the four remaining as a "main idea" for the rest. The following is one such cluster:

> tribe   individual
> society   family group
> Hoover Middle students

a student should cross out "individual" and circle "society"

as the main idea. The following day, the students are divided into groups of three or four to compare their responses to the worksheet.

A group of students who missed these two classes because of a chorus rehearsal are given a copy of the word web and the reading assignment. When they have read the chapter, they go to the computer lab and load a copy of the vocabulary worksheet, two students to a computer. In this way they retain some of the benefits of the small group interaction. As each pair completes the worksheet, they check their responses against a key the teacher has stored on disk.

Several students on the team are receiving supplemental instruction from the school reading teacher. He uses the vocabulary given him by the social studies teacher to set up a Word Attack file. His students then can get additional practice with these terms on one of the computers in the reading lab.

At the end of the unit, students are given several options which they may complete for credit. Among these are vocabulary activities in the computer lab. One option is to use Crossword Magic to develop a crossword puzzle with unit vocabulary. Another is to develop analogies with the vocabulary. Crosswords and analogies would be stored on disk and available in the computer lab for other students to use as they prepared for their unit test. The teacher could also load them to the computer screen to check students' work.

In this example, the microcomputer does not teach content area vocabulary itself; it is used as a tool for providing reinforcement of vocabulary which a teacher has identified and presented in class. Such computer applications are often referred to as "drill-and-practice", which carries the connotation of busy-work, but these activities can be challenging and effective when used judiciously to follow up instruction.

Teachers obviously need to be aware of the full range of possibilities offered by the computer. When pre-programmed drill-and-practice routines are followed with little consideration for whether they are needed by students or congruent with curricular objectives, it is difficult to

justify their use. However, when a content teacher or reading specialist uses the computer to complement and reinforce classroom instruction, they have given the computer its best means of proving its effectiveness and its efficiency.

REFERENCES

Balajthy, Ernest. "Computer simulations and reading." The Reading Teacher, vol. 37 (March 1984), pp. 590-593.

Beck, Isabel and Margaret McKeown. "Learning words well--a program to enhance vocabulary and comprehension." The Reading Teacher, vol. 36 (March 1983), pp. 622-625.

Blanchard, Jay and George Mason. "Using computers in content area reading instruction." Journal of Reading, vol. 29 (November 1985), pp. 112-117.

Carr, Eileen and Karen Wixson. "Guidelines for evaluating vocabulary instruction." Journal of Reading, vol. 29 (April 1986), pp. 588-593.