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ABSTRACT

The lack of emphasis on occupational literacy competencies in most public school reading curricula leaves students poorly prepared for the demands of the workplace. Most jobs require mastery of the following literacy competencies: technical vocabulary; locating and using information; following directions; and self-monitoring of comprehension and performance during work tasks. While it is not possible to equip students for specific job settings, teachers can help students develop these literacy competencies by using such instructional techniques as semantic mapping, monologing, metacognition, and reciprocal teaching. (Two diagrams and 16 references are attached.) (MHC)

Job Skills:

Basic Literacy Competencies Which Schools Overlook

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Running Head: JOB SKILLS

ABSTRACT

Teachers of reading, like all educators, are in the business of preparing learners for successful, productive lives. Traditionally, this has meant an emphasis on the language/thinking competencies of school--those of acquiring knowledge for long-term retention. This tradition, however, overlooks the major role of work in the future of every individual.

Occupational success requires the immediate accomplishment tasks. Thus, a future-oriented curriculum requires that instructional planning account for performance skills as well as academic skills. This paper focuses on occupational reading competencies in vocabulary, finding and using information, following instructions, and methods of self-regulating performance of these competencies.

Job Skills:
Basic Literacy Competencies Which Schools Overlook

Reading is an essential and almost universal requirement in the workplace. On the average, workers spend two hours per day in tasks involving reading (Diehl, 1980; Sticht, 1982). Yet, given the academic orientation of most public school programs, essential occupational literacy competencies receive little instructional attention.

Mikulecky (1982) has called attention to important discrepancies between school practice and workplace reality. His studies of reading suggest that students, even at the high school level, are poorly prepared for the demands of work. Compared to workers, student reading is less frequent, less competent, done with less effective strategies, and involves less difficult materials. Observation of school practice suggests that, although essential "real-world" reading skills are introduced, it is uncommon for them to be emphasized. It is more unlikely for them to be taught in conjunction with occupational applications.

Occupational Competencies

The literacy competencies required in occupational settings include mastery of the following: technical vocabulary, locating and using information, following

instructions, and self-monitoring of comprehension and performance during work tasks.

For each occupation, there are technical terms which workers must know in order to perform their duties successfully. Three types of terms must be mastered: single-meaning technical words, everyday words with special occupational meanings, and multi-word meaning units. Single meaning technical words include the following examples: "catheter" (nursing), "gable" (building trades), and "camshaft" (automotive mechanics). Everyday words with technical meanings are terms such as: "irrigate" (nursing), "flashing" (building trades), and "distributor" (automotive mechanics). Multi-word meaning units include such terms as, "overhead cam" as opposed to "overhead valve," and "root feeder" as opposed to "feeder route." In occupational communication, essential vocabulary must be recognized, understood, and used appropriately. Common words with special job-related meanings and multi-word meaning units merit special instructional attention.

In approximately two-thirds of all job-related reading tasks, reading is used on-the-job as a precision tool for accomplishing work (Diehl, 1980). Finding and using information involves competence with written text and associated graphics such as, tables, charts, figures, and graphs. Workers routinely use such information to accomplish work and seldom entrust it to memory (Rush, Moe,

and Storlie, in press). Rather, they refer back to the same reference materials whenever tasks require needed information.

In order to do their jobs, workers frequently follow instructions which involve application of oral, written, and graphic information to tools and materials in the work environment. That is, nurses, machinists, automotive mechanics, and account clerks must frequently perform crucial tasks while reading instructions containing important facts and figures. Care in following on-the-job instructions is crucial; mistakes can cause loss of time and money, if not physical endangerment. As with reference materials, workers refer back to sets of instructions each time their jobs require the specified procedure to be performed.

Development of these important occupational literacy competencies requires systematic teaching and practice of skills. Some approaches to such instruction are suggested below.

Classroom Methods

It is impractical, if not impossible, for teachers to prepare their students for the literacy demands of specific work settings, but it is possible--and practical--for them to provide training in literacy competencies which have general occupational applications.

Knowledge of word meanings is essential to reading comprehension (Davis, 1944; Spearitt, 1971; Johnson, Moe, and Baumann, 1983). Without mastery of technical word meanings, workers could not learn and perform their duties. Systematic classroom instruction in occupationally relevant vocabulary seems, therefore, necessary--even in early grades.

Two basic understandings are essential in programs of technical vocabulary development: 1) Word parts are valuable aids to vocab ry development; common roots, prefixes, and suffixes unlock the meanings of a wide range of important work-related words, and 2) Words have many meanings; in some jobs and school subjects, familiar words often have very specific, technical meanings.

Technical words with single meanings, when taught and used in relevant contexts, pose little difficulty for most learners. On the other hand, familiar words which have novel technical meanings do pose problems.

Fortunately there are very effective methods for teaching the meanings of everyday words with special meanings. Development of such vocabulary can begin with oral language activities in prevocational classrooms. Teachers can focus instruction on useful word parts through semantic mapping activities (Johnson and Pearson, 1984), in which groups of learners suggest as many possible contexts for a word as can be thought of. Such activities broaden

vocabulary knowledge, but they also increase awareness of the fact that words often have many meanings. In Example 1, a semantic map of the latin prefix "trans-," generated through a class brainstorming session, is illustrated.

Insert Example 1 about here

Semantic mapping is, likewise, useful with words from school subjects--science, mathematics, health, and social studies. These subjects, because they involve words with characteristics similar to work-related technical words can form the basis of the classroom technical vocabulary development program. The word "pressure," for example, occurs in many contexts--automotive, medical, psychological, etc.--with different shades of meaning. Technical words can also be obtained from lists such as those provided by Rush, Moe, and Storlie (1986), from do-it-yourself and repair manuals, and from written materials used in local workplaces.

Multi-word meaning units can be taught through a modified semantic mapping (Johnson and Pearson, 1984) activity. Phrases like "least common multiple" and "reading circle" have meanings which are distinct from the meanings of their individual words. In Example 2, simple multi-word units are tied to a central concept, "overhead."

Insert Example 2 about here

Finding and Using Information

Locating and applying information is really a two level process. At the first level is identification of appropriate reference materials. The second level requires effective use of the selected reference source. Reference skills taught in American classrooms typically focus on library use, and may be inappropriate for occupational applications. Library skills go beyond the needs of workers in identification of references and neglect the details of using the materials. Teachers must, therefore, use modified approaches to teaching useful reference skills.

Occupationally-relevant reference skills can be addressed with the following procedure:

Level One - Reference Selection
Identify Goal
Consider Possible References
Select the Best Reference

Level Two - Use of the Reference
Recall Goal
Select Source
Read/Summarize
Predict Effects
Identify Causes of Uncertainty
Apply Information

(This procedure can be enhanced by adding self-regulatory steps. An example is described in the Reciprocal Teaching section, below.)

Following Instructions

The process of following written or oral instructions parallels the thoughtful, reflective steps of the Directed Reading/Thinking Activity (DRTA) described by Stauffer (1980). Readers should be aware of their purposes, prepare themselves by surveying the task, summarize their progress at appropriate intervals, and reread and recheck instructions and work carefully. They should also bear in mind that following instructions demands careful attention to detail and a much slower pace than is necessary in most other reading tasks.

In classrooms, following instructions usually involves written text and requires only paper and pencil responses. In most occupational settings, however, instructions, expressed in combinations of text and graphic formats, require workers to take action with equipment and materials.

Sources of materials for developing necessary skills are readily available. Relevant activities can be based on recipes, educational and parlor games, model building kits, instructions for household appliances, and instructions brought from actual workplaces.

Instruction in reading and following instructions should include reminders to concentrate and work carefully. Teachers should provide instruction and practice in the use

of a systematic, self-directed approach to written instructions. The following approach is recommended:

1) Prepare. Develop a "mind-set" for what is to be done by reading the entire set of instructions, examining headings, graphics, numeric information, and any tools and equipment to be used in the task. (Clarify meanings of unfamiliar words and symbols here.)
2) Read the first step carefully and do as it directs.
3) Reread the first step and check work.
4) Read, do, reread, and check each of the remaining steps.
5) Reread and check the entire set of instructions.

Orderly procedures for following instructions can be effectively modelled by teachers during classroom instruction. Mikulecky and Diehl (1983) recommend the practice of "monologing," in which teachers orally describe their thoughts and actions as they perform tasks involving instructions and/or reference materials. Monologing, as an aid to following instructions, can be taught by teachers who, as a matter of daily routine, explain the value of "talking-through" the steps of important procedures, demonstrate the process, and provide opportunities for learners to practice its use. This technique can easily be integrated with the teaching of important self-regulatory skills.

Self-Regulating Performance

Metacognition, the active self-monitoring and self-control of thinking (Flavell, 1976), can have powerful effects on reading-to-do. Whereas cognition refers to the processes of learning, understanding, and memory, metacognition refers to processes which enable more effective comprehension and learning. Both Stauffer's DRTA and Mikulecky and Diehl's monologing technique (when used by students or workers) are examples of metacognitive methods.

Effective thinkers, as judged by their ability to solve problems, monitor and control their problem solving strategies; less effective thinkers do not (Sternberg, 1979). Superior thinkers monitor their comprehension, seeking clarification when confusion is sensed. Less effective thinkers, in contrast, are often unaware of confusion or lack of understanding (Bransford, 1979).

There is increasing evidence, however, that people can learn to use metacognitive processes to perform more effectively (Sternberg, Ketron, and Powell, 1982; Palincsar, 1984; Brown, Campione, and Day, 1981). Indeed, it seems that, through practice and overlearning, those processes become unconscious habits (Flavell and Wellman, 1977).

Palincsar (1984) defines four important metacognitive competencies which affect reading comprehension:

1) Self-questioning (i.e., questions about ideas, relationships, sequences and details which serve to focus attention during reading)
2) Summarizing information after reading part or all of a passage
3) Predicting what might come next in a passage
4) Identifying unclear aspects of a text and seeking clarification (i.e., by rereading, looking back in the text, or resorting to glossaries or other references.

The value of metacognitive strategies for teaching the performance-related skills of finding and using information and following instructions should be clear. In a task involving, for example, reading to operate an automatic dishwasher, many individuals might use a common approach. That is, to start at the beginning, reading and doing each step in order. This strategy does not assure thoughtful use of the instructions, and is much less effective than one which involves metacognition.

Other persons, using a metacognitive strategy, would consciously prepare to learn by surveying the instructions, considering the meanings of key words, headings, captions, and graphics recognizing cues to main ideas and relationships. Simultaneously, they would develop

hypotheses about the instructions by associating ideas identified in the survey with memories of similar prior experiences. After this preparatory activity, they would read to verify expectations, stopping periodically to seek clarification and to evaluate comprehension by summarizing key information.

Typically, members of both groups would feel that they had mastered the operation of the dishwasher. The second, however, by virtue of planned, self-controlled interaction with the instructions, would have performed better.

In that metacognitive processes are important in occupational and educational contexts, there are very good reasons for devoting instructional time and effort to their development. Training in metacognitive skills should have immediate positive effects on school learning and similar long-range effects on comprehension and performance on the job. Fortunately, methods of teaching self-regulation of these processes have been developed.

Reciprocal Teaching

Reciprocal teaching is an effective procedure for teaching location and use of information and following instructions in conjunction with metacognitive strategies. The approach, derived from ReQuest, Manzo's (1969) reciprocal teaching procedure, involve group instruction in which teachers model metacognitive behavior. To insure

effective learning, the role of "teacher" is rotated among the participants--thus, making teaching reciprocal. This supervised practice enables evaluation, immediate feedback, and corrective intervention as metacognitive competencies develop.

The effectiveness of systematic teaching of strategies for monitoring and fostering comprehension has been documented by Brown, Campione and Day (1981); Collins and Smith (1982); Palincsar (1984). Consider Palincsar's metacognitive steps in the context of finding information:

Stage 1)		Stage 2)
Teacher Modelling of Procedure		Student Practice
Identify Goal Self question Select Source Read/Summarize Predict Effects Identify Causes of Uncertainty Apply Information	Thinking Aloud	Teacher Supervises, Gives Feedback and Correctives

In this procedure, teachers "think aloud," or in Mikulecky and Diehl's terms "monologue," orally stating the goal of reading and questions to be answered by reading the source. Then, they read the selection aloud, pointing out evidence which answers their questions. At times when a confusing word, phrase, or graphic is encountered, the confusion is verbalized and its source identified. Teachers also comment on insights about features of the text--such as, headings, graphics, and author's style--which affect comprehension. After reading, the information is summarized

and predictions are made about the effects of its use. If summaries or predictions are tentative, sources of confusion are identified. Finally, information is applied in the performance of a task.

Reciprocal teaching studies have focused on reading comprehension, but, as the foregoing example illustrates, it can be used to teach learners how to select and use reference materials. The method seems equally well suited to teaching following instructions metacognitively.

The focus of this paper has been on the importance of certain occupational reading competencies which can be introduced in schools. It is virtually impossible to equip students with the literacy competencies of specific jobs without direct knowledge of job settings, and such knowledge is largely inaccessible to most teachers. Fortunately, students can be helped to develop certain general capabilities which are necessary in many occupational contexts.

Important competencies which can be taught through routine classroom procedures include technical vocabulary knowledge, finding and using information, following instructions, and self-regulation of comprehension and performance. Several approaches to developing these competencies have been described here.

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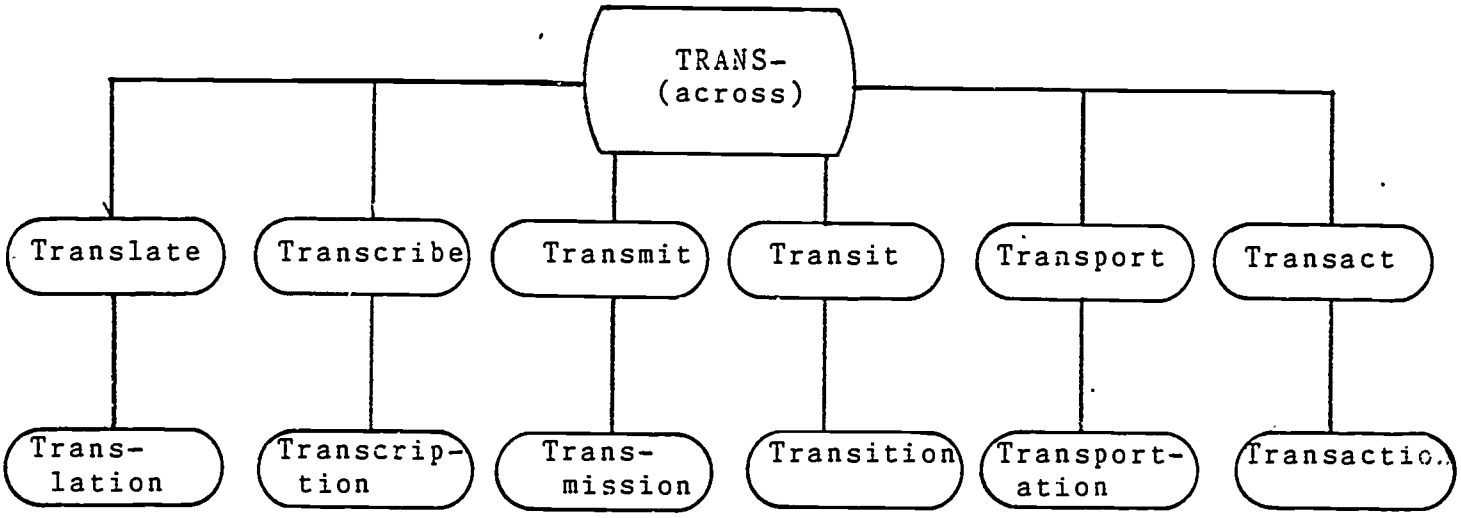
Example 1

Partial Semantic Map of the Latin Prefix "Trans-"



Example 2

Semantic Map - Multi-Word Meaning Units