Word Study and Reading Comprehension: Implications for Instruction
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Reading comprehension is a complex undertaking that involves many levels of processing. One of the most fundamental aspects of comprehension is the ability to deal with unfamiliar words encountered in text. Readers who struggle with word-level tasks use up valuable cognitive space that could be allotted to deeper levels of text analysis. It is not enough to rely on context cues to predict the meaning of new words, since this strategy often results in erroneous or superficial understandings of key terms, especially in content-area reading (Paynter, Bodrova, & Doty, 2005). Mature readers need to possess a basic knowledge of "how words work" and a set of strategies for approaching new words encountered throughout the day.

This paper examines the interrelationships of spelling and vocabulary as they impact reading comprehension, and focuses on instructional approaches that foster word-level knowledge. Most of the examples and research cited will be geared to the junior and intermediate divisions, although the same general conclusions can be applied to all grade levels.

How word knowledge affects reading comprehension
Vocabulary knowledge is one of the best predictors of reading achievement (Richek, 2005). Bromley (2004), in a comprehensive review of research on vocabulary development, concludes that vocabulary knowledge promotes reading fluency, boosts reading comprehension, improves academic achievement, and enhances thinking and communication.

Spelling is also an important consideration in reading comprehension. The concepts about sound patterns that children learn in the early years through invented spelling and direct spelling instruction help them to decode new words in their reading. As they mature and begin to spell longer and more complex words, children apply the concepts of base words, prefixes, and suffixes to their spelling. This knowledge of morphology, in turn, helps them to deconstruct longer words encountered in their reading. Templeton (2004) argues that spelling knowledge provides the basis for explicit awareness and understanding of morphology, which, in turn, may guide the systematic growth of vocabulary knowledge. Considering the strength of vocabulary knowledge in predicting reading achievement, the complex interrelationships among these areas are significant.

Stanovich (1986) describes the cumulative effect of poor reading and vocabulary skills. Children who are poor readers usually also lack a wide vocabulary. When young children struggle with reading, they quite naturally read less than their more able classmates, and therefore are exposed to fewer new words. This restriction on their vocabulary growth, in turn, makes progress in reading even harder. The effect of these deficits makes learning in general more difficult, and as children progress through the

grades, the gap between skilled and less skilled readers becomes increasingly pronounced.

What it means to "know words"

Skilled language users display "word consciousness" (Blachowicz, Fisher, Ogle, & Watts-Taffe, 2006). They have a metacognitive understanding of how words are built, and can articulate the strategies they employ as readers to solve unfamiliar words. Cognitive developmental research (Beers & Henderson, 1977; Read, 1971; Templeton, 1983) has shown that most children acquire an understanding of word structure in a progressive, stage-like manner. Through oral language, an exposure to written texts, and their own writing, they begin as young children to explore the patterns of sound, or graphophonemic concepts. In the middle grades, most students are able to add simple affixes to base words and to grasp the rules for making words plural, changing verb tenses, forming possessives and contractions, and adjusting the spelling of base words when adding affixes such as *–ed* and *–ing*. Older students use morphological knowledge to apply the *spelling/meaning connection* to words derived from the same base. For example, they are able to spell the hard-to-hear schwa vowel in *opposition* by relating it to the base word *oppose*, and to remember the silent *c* in *muscle* by relating it to the derived form *muscular*, in which the *c* is pronounced. This knowledge also enables older students to read unfamiliar complex words and to grasp the meaning of these words when encountered in oral language.

Throughout each of these stages, children also acquire a sight vocabulary of words they recognize automatically in their reading and use readily in speaking and writing. Many of these high frequency words, such as *said, have, because* do not follow typical word patterns and often are learned by applying a variety of word-level strategies. For example, a sixth grader once told me he remembered the spelling of *because* by applying the mnemonic *Bears eat candy and usually swallow everything*!

In addition to basic word recognition and spelling, however, students need to have a deep understanding of word meaning. Rather than simply knowing the literal meaning of a new concept, it is important that students explore the multiple meanings of words, and how similar words differ from one another. The connotations of new words is also worthy of discussion, so that children understand the subtle differences in meaning between words such as *request* and *demand* or *cold* and *frigid*. These distinctions are particularly acute in content-area studies, in which new words are introduced with each topic studied. In science, for example, it is important for students to understand the differences between words such as *opaque*, *translucent*, and *transparent*, and to be able to read and spell long words such as *photosynthesis*.

Children come to school with wide variations in their levels of vocabulary. Biemiller (2004) found a 4,000 word difference in root vocabulary knowledge by the end of Grade 2 between children in the highest vocabulary quartile and those in the lowest quartile. He attributed these large differences to factors such as levels of parental language support and encouragement, other language sources (e.g. caregivers, day care, preschool etc.), and child constitutional differences in the ease of acquiring new words. A

related finding is the gap in vocabulary knowledge between economically disadvantaged and economically advantaged children that begins in preschool and persists through the school years (Blachowicz et al., 2006). Since vocabulary knowledge is one of the best predictors of reading comprehension, these studies point to the need to address word study in classrooms at all grade levels.

Instruction that fosters the growth of word knowledge

There is a general consensus among researchers concerning instructional principles underlying effective word study. Rather than supporting rote learning and a reliance on a narrow range of instructional strategies, current research calls for instruction that meets the needs of the diverse learners in each classroom, and that encourages higher level thinking about language. Applying these principles in elementary classrooms is, however, challenging. These approaches rely upon teachers who have a deep knowledge base in language and who possess a range of instructional skills related to word study in reading, spelling, and vocabulary. Vocabulary instruction has not been given high priority in pre-service, in-service, or graduate courses until very recently (Manzo, Manzo, & Thomas, 2006). Templeton (2004) also points to a lack of adequate professional development in the area of spelling instruction. He maintains that teachers have not been provided with the knowledge foundation or the type of instructional resources that support a well-grounded and systematic scope and sequence for spelling. Templeton also calls for the integration of spelling and vocabulary instruction, especially in the middle and later grades.

Vocabulary instruction is most effective when there are shared practices and a common philosophy among teachers in a school or school board based on a solid understanding of the knowledge base on vocabulary development and word learning (Blachowicz et al., 2006). These researchers emphasize the following characteristics of good vocabulary instruction:

1. *It takes place in a language and word-rich environment that fosters "word consciousness."*

Tompkins and Blanchfield (2004) maintain that effective vocabulary instruction begins with a teacher's excitement about words. This can also be said of the teaching of spelling and all aspects of word study. When the teacher displays a fascination with how "words work," then students are more likely to share this enthusiasm. They also are given the important message that words are relevant throughout our lives and are not simply sterile elements on a page.

Teachers perform a valuable function when they model their own word-solving strategies with students in the form of think-alouds. This may take the form of learning the meaning of a new word they have read or heard spoken. It can also involve modelling strategies they use to spell a particularly difficult word.

A word-rich classroom environment will contain an abundance of resources for reading, speaking, and writing. Wide reading has been shown to be a major source of word learning (Cunningham & Stanovich, 1998). Both fiction and non-fiction materials

will be available in a variety of genres and text forms at an appropriate range of reading levels. Teachers can encourage wide reading through read-alouds, shared reading, and independent reading.

Technology will be integrated into each subject area so that words can be experienced through Internet websites, DVDs, CD-ROMS, podcasts, online dictionaries and thesauruses, books on tape, graphics programs, and so forth. Word play can be fostered through websites that provide word games; other sites can provide valuable information about word origins and new words in English.

2. ***It includes intentional teaching of selected words, providing multiple types of information about each new word as well as opportunities for repeated exposure, use, and practice.***

Students should be actively engaged in learning the meanings of specific words. They should access their prior knowledge about the new concept, relate it to the meanings of other words they know, and apply it to realistic contexts. For example, the word *condo* could be explored on a number of levels. Students could begin by sharing what they know about condos. They are like apartments, but with a difference. Some students may live in a condo and be able to explain the difference. Structurally, *condo* is an abbreviation of *condominium*. When we look at the component parts, we see the prefix *con*, meaning *together with* or *jointly*, and the root word *dominium* (dominion) meaning *sovereign control*. Therefore, a *condominium* is a unit in a building in which all units are owned by the residents. Similar word analysis should take place when new terms are encountered in every subject area.

Biemiller (2004) argues that, although vocabulary levels diverge greatly during the primary years, virtually nothing effective is done about this in schools. Too often, words are not explored for their complex meanings, or are simply presented once. He advocates reading the same book multiple times, as in shared reading, rather than several books once. Teachers should also call attention to key aspects of the new words instead of assuming children will learn the meanings merely through context (although context is an important strategy and is crucial in making words relevant).

The multiple relationships among words can be explored effectively through the use of graphic organizers. Word webs show how the key word is related to various other categories of words. Semantic feature analysis compares similar concepts by specifying a variety of features. Venn diagrams show the unique aspects and shared features of two or more terms. Computer software such as *Inspiration* and *Kidspiration* facilitate the classroom use of these graphic organizers.

These instructional strategies go far beyond the traditional approach to vocabulary acquisition, which often requires students to locate the word in the dictionary and use it in a sentence. The dictionary is still a valuable tool for word knowledge, but is seldom mined adequately for its valuable information. Students need to be taught dictionary skills such as the use of guide words, and should be shown the various components of a

dictionary entry, which may include multiple meanings, word origins, sample sentences, pronunciation guides, and the spelling of inflected forms.

Just as Biemiller argues for a more systematic approach to vocabulary development, Templeton (2004) suggests a more theoretically and empirically grounded scope and sequence of spelling and vocabulary instruction than has traditionally been available to guide curriculum design and development. He recommends the developmental framework based on the work of Beers & Henderson, (1977), Read (1971), and Templeton (1983). Fortunately, the spelling and word study expectations and examples in the revised *Ontario Curriculum Grades 1-8: Language* (2006) reflect this developmental continuum.

3. ***It includes teaching generative elements of words and word-learning strategies in ways that give students the ability to learn new words independently.***
There are many approaches to choosing words to address for vocabulary instruction: content area terms; words encountered in reading and oral language; most frequently used words. The term *generative elements* refers to word parts that that can be used to learn other words. These may include common roots, prefixes, and suffixes, as well as base words to which many affixes can be added. For example, the base word *phobia* can be combined with many other Latin and Greek roots. Knowing that *phobia* refers to an exaggerated fear facilitates an understanding of new forms such as *agoraphobia* (an abnormal fear of open spaces or public places). On a simpler level, when younger children are introduced to the concept of compound words, they can begin to see the logic inherent in many longer words (e.g. *sunlight; moonlight; lighthouse*).

There is also strong research support for encouraging students to select words they wish to study (Blachowicz et al., 2006). This vocabulary may relate to content-area words, vocabulary students need for writing, or words arising in literature and discussed in literature circles.

Teachers can capitalize on vocabulary instruction through read-alouds with students and shared reading activities. It is important to involve students in discussions during and after listening to a book. The teacher can scaffold this learning by asking questions, adding information, or prompting students to describe what they heard (Blachowicz et al., 2006).

These discussions can also facilitate the development of independent word-solving strategies in students. Being able to develop independent strategies for dealing with new words in all aspects of their lives is a vital skill for students. A range of strategies should be taught explicitly, and teachers should also encourage students to reflect on the strategies they employ when reading or spelling an unfamiliar word. Unfortunately, research on the types of instruction that best facilitate independent strategies for word-learning is limited and inconclusive (Blachowicz et al., 2006).

Another key area for future research is the assessment of word knowledge. Standardized tests measure only limited facets of this complex area and often are unable

to attend to subtleties of word meaning. Furthermore, teachers need to be able to determine needs of individual students in order to plan scaffolding support that is appropriate to the child's stage of development.

Conclusion

Reading comprehension is influenced significantly by a student's level of word knowledge, which includes vocabulary and spelling skills, as well as the ability to decode words in print. "Knowing words" involves understanding both the structure and meaning of words at various levels of complexity. Teachers can facilitate the growth of word knowledge through the explicit teaching of word patterns and word-solving strategies within the context of a word-rich classroom. The goal of instruction in reading, spelling, and vocabulary is to help students develop "word consciousness" and to become independent word-solvers in all subject areas.

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