

5 Vocabulary Development

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At the college level our goal is to increase the breadth of our students' vocabularies (i.e., the number of words for which students have a definition), as well as the depth and precision of their word knowledge. But the goal is much more than improving students' word knowledge. Recent federal reports (e.g., RAND Reading Study Group, 2002) have indicated that vocabulary knowledge is one of the five essential components of reading. Given that most college students are expected to read content area textbooks packed with concepts and technical vocabulary that they need to understand fully, if they are to learn, the relationship between vocabulary and comprehension becomes even more significant (Harmon, Hedrick, Wood, & Gress, 2005; Rupley, 2005). If too many general or technical words puzzle students, they will read in a halting manner, a behavior that compromises their reading fluency (Joshi, 2005). Moreover, when the processing demands for reading a textbook become elevated because of the vocabulary load, many students will have little, if any, cognitive energy left for thinking about key concepts or monitoring their understanding (Scott & Nagy, 2004).

In sum, if college students are to succeed, they need an extensive vocabulary and a variety of strategies for understanding the words and language of an academic discipline. In order to assist their students, college reading professionals need to be aware of research-validated and effective approaches and strategies for vocabulary development. This chapter, organized into four main sections, reviews the research and theory related to vocabulary development and offers practical teaching and programmatic guidelines.

In the first section, we examine the issues related to vocabulary development and instruction. Next, we highlight research studies that have investigated how best to develop college students' vocabulary knowledge. In the third section, we outline seven guidelines for effective vocabulary practices. We conclude with a section outlining future avenues.

VOCABULARY DEVELOPMENT AND INSTRUCTION

Prior to developing an approach for enhancing students' word knowledge, college reading professionals should acknowledge the theoretical issues concerning vocabulary development. Possibly the most important theoretical issue is what constitutes word knowledge. Closely related to this first issue is the troublesome methodological issue that considers how to measure word knowledge and vocabulary growth in our students. The third theoretical issue addresses the role of students as they attempt to acquire vocabulary knowledge.

What does it mean to know a word?

The extant research on this question has been well documented and investigated over the last 50 years (e.g., Dale, 1965; Stahl, 1999), and it appears that such knowledge exists in degrees or on a continuum. In his seminal piece, Dale suggested that word knowledge follows four stages: (a) I've never seen the word; (b) I've heard of it, but don't know what it means; (c) I recognize it in context, it has something to do with...; and (d) I know the word in one or several of its meanings.

Dale's four stages are useful, but Stahl (1999) expanded upon the idea by suggesting that students should have "full and flexible knowledge" of that word. Stahl defines full and flexible knowledge of a word as knowledge that "involves an understanding of the core meaning of a word and how it changes in different contexts" (p. 25). This definition comes from his previous studies on contextual word knowledge (Stahl, 1986), which is described as the ability of students to understand that the concept of a word changes depending on the context in which it is found. Stahl's (1999) definition of full and flexible knowledge of a word lends support to the idea that the more exposure students have to an unknown word, the more opportunities they have to forge connections and interconnections between words. Therefore, when students acquire full and flexible knowledge of a partially known word, they are able to use it and identify it correctly in different contexts.

Awareness of the different levels of word knowledge aids in understanding of the notion that it is not whether or not a student knows a word, but at what level the word is known. That is, a student can know many words, but only possess a smattering of words at the full and flexible word knowledge level. If that is the case, the student may be at a disadvantage when forced to utilize a variety of words in written or spoken forms. That is not to say that all encountered words must be known at the full and flexible word knowledge level; many words can be known at the partial word knowledge level and still be useful for students. However, if instructors want to increase their students' vocabulary knowledge so that it will be most beneficial to their comprehension and learning, it would be prudent to encourage full and flexible word knowledge levels (Baumann, Kame'enui, & Ash, 2003; McKeown & Beck, 2004).

As we acknowledge the necessity of students obtaining full and flexible word knowledge levels, it is also pertinent to discuss the methods of measuring vocabulary growth and development.

Measuring vocabulary knowledge

The bulk of current research into vocabulary knowledge has focused on vocabulary instruction, not on formats for evaluating and assessing vocabulary knowledge. College reading professionals, however, need to understand the options for measuring, in a valid and reliable manner, their students' level of vocabulary knowledge. Moreover, the type of assessment used to measure vocabulary knowledge should match the instructor's philosophy regarding word knowledge (Baumann et al., 2003; Joshi, 2005). If this matching between philosophy, instruction, and test format does not occur, it is quite likely that students' level of vocabulary knowledge will be overestimated or masked in some way. For example, if students are taught vocabulary words using synonyms and contextual examples, they may perform poorly on a straight multiple-choice definition assessment of those words. A better measurement might be a test that asks students to create their own context for the targeted words.

Curtis (1987), in her classic chapter on vocabulary, addressed typical vocabulary testing in the form of standardized assessments and what these assessments measure about vocabulary knowledge. She concluded that while standardized reading tests do require students to know commonly occurring words, students only need to have a

moderate level of word knowledge. If, however, students are required to know the word in multiple contexts,

In terms of comprehension, multiple-choice and matching formats may be more useful for assessing word knowledge (Brozo & Simpson, 2003). As noted by several researchers, there are several limitations to the use of students' conceptual knowledge of words (Stahl, 1999, p. 796). Perhaps the multiple-choice format is the most useful, especially for students who are initially poorly constructed or who do not permit students to use a word.

What is needed are more studies on students' vocabulary knowledge (Francis & Simpson, 2003; McKeown & Beck, 2004). More systematically researched, reading professionals need to acquire, use vocabulary knowledge, and measure the level of

Role of students in vocabulary acquisition

The third theoretical perspective on vocabulary acquisition is that students must be able to make sense of what they read (Francis, 2004; Winn, 2003). The learner has been the focus of research who proposed that a focus on reading in better performance. This perspective supports this core idea.

Within these theoretical perspectives, it is difficult to quantify the level of more elaborative processing that is involved in the instructional model. The model involves *associative learning*. In *associative learning*, students make associations between words. For example, students might learn that evil is not evil, but the associative learning might involve completing multiple-choice questions on student involvement.

The next level of processing is known as *association* of the word. Students learn other words, complete the third level of processing, and create a novel context for the word. In reading, the deepest level

moderate level of word knowledge in order to successfully answer the questions. That is, students may “know” a word at the definitional level but not be aware of how to use the word in multiple contexts or provide examples using that word.

In terms of commercial materials, evidence suggests that they typically use multiple-choice and matching formats as the main method of reinforcing and testing vocabulary knowledge (Brozo & Simpson, 2007; Joshi, 2005; Stahl, Brozo, & Simpson, 1987). As noted by several researchers (e.g., McKeown & Beck, 2004; Nist & Simpson, 2000), there are several limitations to these formats. That is, they cannot reveal the dimensions of students’ conceptual understanding, and they make vocabulary knowledge appear “flat, as if all words are known to the same level or unknown” (Beck & McKeown, 1991, p. 796). Perhaps the most important factor to be remembered about the multiple-choice format is the influential role that distractors play in a test item. Distractors, especially poorly constructed ones, can actually confuse students who understand a word or permit students who do not understand a word to guess correctly at the meaning of a word.

What is needed are formats that are more sensitive to the dimensions and levels of students’ vocabulary knowledge. Although some attempts have been made (e.g., Francis & Simpson, 2003; McKeown & Beck, 2004), these alternative formats have not been systematically researched or incorporated into everyday practice. In order to be effective, reading professionals must identify the word knowledge level they want students to acquire, use vocabulary strategies that will help students learn at that level, and then measure the level of learning with appropriate formats.

Role of students in vocabulary acquisition

The third theoretical issue concerning vocabulary knowledge involves the students’ role in vocabulary acquisition. The extant research suggests that students who actively try to make sense of what they see and hear are those who learn more (Simpson, Stahl, & Francis, 2004; Winne & Jamieson-Noel, 2002; Zimmerman, 2002). The activity of the learner has been theoretically defined by Craik (1979) and Craik and Lockhart (1972), who proposed that deeper, more elaborate and distinctive processing of stimuli results in better performance, all other things being equal. Strategy research with college learners supports this concept (e.g., Nist & Simpson, 2000).

Within these theoretical frameworks, which are speculative, vague, and somewhat difficult to quantify, Stahl (1985) proposed a model that described the different and more elaborative processes involved when students learn new words. Depending upon the instructional methods used, students learning new vocabulary words should be involved in *associative processing*, *comprehension processing*, and *generative processing*. In *associative processing*, the shallowest level of processing, students are able to make associations between words and a synonym or definition in only one context. For example, students may know the word *ominous* and that its definition is threatening evil, but the association would be solely to the context of weather. This level of word knowledge might involve students in activities such as matching definitions to words or completing multiple-choice questions. Associative processing requires the least amount of student involvement and effort, but it is the basis for the next two levels.

The next level of processing, *comprehension processing*, requires students to take the known association and connect the word to a new context, indicating understanding of the word. Students can demonstrate this understanding by grouping the word with other words, completing a cloze exercise, or matching a word to its antonyms. The third level of processing is *generative processing*, and it involves students in producing a novel context for the word. For example, students are engaged in generative processing, the deepest level of processing, when they are able to create personal sentences,

develop semantic maps of the word, or participate in discussions using the word. In their time-honored instructional study, Beck and McKeown (1983) created a comprehensive program of vocabulary research and development that involved students in a variety of generative processing activities. In the study, students were asked to answer questions using the words they had been taught (e.g., would a *glutton* tend to be *emaciated*?) rather than simply matching definitions to the words they were studying.

When researchers compare different vocabulary strategies to determine which is more effective, they often fail to define adequately or keep equivalent the processing requirements (or involvement) of the learners (Mezynski, 1983; Stahl & Fairbanks, 1986). Consequently, a strategy that actively engages the learner in solving problems, answering questions, or producing applications in new situations may be compared directly with another strategy that asks the learner to fill in the blanks or to match words with definitions. Not surprisingly, the more active strategy involves the learner in generative processing and therefore appears to be the superior method of vocabulary instruction. Researchers and teachers should thoroughly address these issues before they draw conclusions about the effectiveness of any one vocabulary approach.

IMPLICATIONS AND CONCLUSIONS FROM THE RESEARCH ON VOCABULARY DEVELOPMENT AT THE COLLEGE LEVEL

This section examines the trends and conclusions from the existing literature on vocabulary development at the college level. Most of the studies, which were conducted in the 1970s and 1980s, focused on intermediate-aged students, rather than college students. Moreover, many of the studies seemed to have inherent limitations in that the researchers did not address the theoretical issues of what it means to know a word and how their assessments measured word knowledge. And in terms of research designs, numerous researchers asked students to read artificially constructed texts and overlooked the importance of training students to employ the targeted vocabulary strategy.

Although the recent research on vocabulary development at the college level has not been particularly plentiful, there is a small body of research that does provide college reading professionals with direction and guidance as they seek to evaluate and improve their programs for increasing students' vocabulary knowledge. Therefore, we have chosen to structure our review of the extant literature according to the following three approaches: (a) traditional word knowledge approaches, (b) content-specific vocabulary approaches, and (c) student-centered approaches. It is apparent to us that many of the studies described in this section could be placed in more than one of these organizational categories, but we have attempted to place studies in the first logical category. In addition, the majority of studies in this section were conducted with college students, but in some situations we have opted to include studies that used younger students because they were particularly noteworthy and therefore applicable to college students.

Studies on traditional word knowledge approaches

Anderson and Freebody's (1981) instrumentalist hypothesis seems to be the basis for the studies that have focused on general vocabulary improvement. The instrumentalist hypothesis maintains that word knowledge is a direct causal link affecting comprehension. Thus, the more individual word meanings taught, the better students comprehend any new or difficult expository material they read. Anderson and Freebody stressed that the most distinguishing characteristic of the instrumentalist hypothesis is the emphasis on direct and generic vocabulary-building exercises.

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Morphemic analysis

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Initial studies in the late 1960s and early 1970s emphasized word lists and repetitive instruction along with dictionary definitions. In the late 1970s and early 1980s there was a move to encourage more generative and active strategies, with students learning a majority of words in authentic contexts. Recent studies have continued to stress the importance of deeper levels of processing vocabulary, often combining methods in an effort to improve instruction (Fisher & Blachowicz, 2005; McKeown & Beck, 2004; Rupley, 2005). However, the studies are varied, and therefore we have created an organizational format for this section. We will examine traditional word knowledge approaches using the following organizational schema: (a) morphemic analysis, (b) dictionary definitions and synonyms, (c) contextual analysis, and (d) keyword studies.

Morphemic analysis

A common practice in vocabulary instruction at the college level is to train students in morphemic analysis as a means of helping them decipher the meanings of unknown words they might encounter in their reading. A *morpheme* is the smallest unit of language that still retains meaning. For example, *triangle* has two morphemes—*tri* and *angle*. *Free morphemes* (e.g., *sad*, *boy*, *jump*) are root words that can function independently or with bound morphemes. *Bound morphemes* (*un*, *ing*, *ness*), including prefixes and suffixes, have meaning but must be combined with free morphemes. Morphemic analysis requires knowledge of prefixes and suffixes and their meanings, knowledge of associated spelling and pronunciation changes, and extensive knowledge of root words. In theory, students who know a multitude of prefixes and suffixes can generate new words by adding bound morphemes to newly acquired free morphemes, or root words (Graves, 2004).

Using morphemic analysis to teach vocabulary to college students does appear to be a college tradition. When Stahl et al. (1987) conducted an analysis of 60 college vocabulary textbooks, they found that 80% of them emphasized morphemic analysis as an independent word learning technique. Although using morphemic analysis to teach students in all age levels has been widely recommended (Dale, 1965; O'Rourke, 1974; Stahl & Nagy, 2006), there have been few, if any, studies that have demonstrated on a consistent basis that college students can be taught to use morphemic analysis as an independent word-learning technique. Baumann et al. (2003) reviewed the literature on morphemic analysis and agreed that more research needed to be done in the area, but that the limited research available indicated that intermediate-age students were indeed able to learn new word meanings after learning specific morphemic parts.

We were only able to find three training studies that addressed morphemic analysis with college students. One of the three studies found that teaching affixes to college students was an effective vocabulary strategy (Albinski, 1970), whereas the other two studies, by Einbecker (1973) and Strader and Joy (1980), found that there was no significant difference in college students' word knowledge when using morphemic analysis versus other types of vocabulary instruction. However, Strader and Joy did find that instruction in affixes increased students' ability to combine morphemes.

Other studies have shown that morphemic analysis instruction has allowed students to exercise a measure of superiority on spontaneous generalization of word meanings (e.g., Nicol & Graves as cited in Baumann et al., 2003; White, Sowell, & Yanagihara, 1989). White et al. taught selected prefixes to students and found that those students were then able to determine the meanings of unfamiliar prefixed words. Similarly, Baumann et al. cited that Nicol and Graves found that students were able to decipher unfamiliar prefixed words up to 3 weeks after instruction. Context also plays a role in the determination of unknown words using morphemic analysis. White, Rower, and White (1989) examined root words with affixes most commonly found in intermediate

dictionaries and consequently students' ability to successfully analyze them. Their findings indicated that while instruction on commonly occurring affixes is important, it is also helpful for students to learn how to decipher root word meanings from context. In fact, the pairing of contextual analysis with morphemic analysis seems to hold considerable merit (Graves, 2004).

As evidenced from the above studies, there is some basis for teaching college students general information about affixes as a method to determine unknown word meanings. However, there have also been some studies that have expressed caution for this practice. Baumann et al. (2003), for example, remarked that morphemic analysis should be only one of many instructional practices used to improve students' vocabulary knowledge. Future researchers might investigate whether or not morphemic analysis can be paired with other instructional methods or whether students, especially striving readers, can be trained to transfer their knowledge of morphemic analysis to their independent reading.

Dictionary definitions and synonyms

When students ask an instructor for the definition of an unknown word, the most common response they receive might be, "Look it up in the dictionary."

While this sounds humorous, it does address the notion that teaching dictionary definitions and synonyms is one of the most prevalent forms of vocabulary instruction, especially in the secondary and postsecondary realm. Students are often given lists of unrelated words to be learned by searching the dictionary or thesaurus. The early empirical studies from the 1970s and 1980s that sought to determine the difference in vocabulary learning between a control group and an experimental group who learned synonyms and definitions found that there was no significant difference between the two groups. That is, those students who learned definitions and synonyms were not at an advantage when it came to improving vocabulary (Crump, 1966; Fairbanks, 1977; McNeal, 1973).

In the 1990s, two influential studies were conducted that offered further insight into the definition and synonym model of vocabulary instruction. In the first study, McKeown (1993) took inconsiderate dictionary definitions and revised them before offering them to students. The students were able to generate examples and illustrations of those words, but when given the original, inconsiderate definitions, the students faltered on measures of vocabulary understanding. The results from this study led McKeown to suggest that if dictionaries are to be used as the primary source of vocabulary learning, students must be taught to navigate accurately through the problems of dictionary entries or the definitions they intend to learn will be useless.

The second study into the definition and synonym method of vocabulary instruction was conducted by Nist and Olejnik (1995). The researchers studied college students' ability to use considerate and inconsiderate definitions and contexts of nonsense words in four measures of vocabulary knowledge. Their findings indicated that students were more likely to engage in higher level vocabulary tasks when the definitions provided were more elaborate and the contexts given were more complete. Therefore, it may be inadequate to send students directly to the dictionary to learn the meanings of words since the dictionary definitions are often difficult to decipher and even harder to put into meaningful contexts.

These studies support the admonitions of many researchers (e.g., Baumann et al, 2003; McKeown & Beck, 2004) who have stressed that students must be taught to use the dictionary effectively if they are to benefit at all from the dictionary and synonym method of vocabulary instruction. Brozo and Simpson (2007), for example, recommended that students be taught the format and organization of a dictionary entry,

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Contextual analysis

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how to interpret the abbreviations and symbols used in an entry, and how to select the most appropriate definition. In addition, college reading professionals should remember that the dictionary is only one part of a quality vocabulary instruction program that emphasizes full and flexible word knowledge. Future research studies might examine the adequacy of definitions found in a variety of dictionaries or glossaries (i.e., content area textbooks) by using the criteria outlined by McKeown (1993) and Nist & Olejnik (1995).

Contextual analysis

The use of context clues for vocabulary improvement has long been highly recommended because of its purported advantages over other strategies. The theory is that students need not be dependent on a dictionary or glossary; instead, when confronted with unknown words, students can independently use the information in the surrounding contexts to unlock the meanings. Proponents suggest that students can be trained to "scrutinize the semantic and syntactic cues in the preceding or following words, phrases, or sentences" (Baumann & Kame'enui, 1991, p. 620). Many secondary and postsecondary reading method textbooks instruct teachers to tell their students to use contextual clues when they come across a word they do not know, and most commercial vocabulary materials for college students emphasize the use of contextual analysis.

Many factors influence a student's ability to use context clues to discover the meaning of an unknown word. Baumann and Kame'enui (1991) and Sternberg (1987) have outlined some of the textual variables that they believe aid or hinder the process of contextual analysis. The variables that seem most pertinent to college learning include the density of unknown words in the selection, the importance of the word's meaning to the comprehension of the selection, the proximity and specificity of the clues, and the overall richness of the context. Individual student characteristics such as prior knowledge in the domain, general vocabulary knowledge, and the ability to make inferences also impact a student's capability to use contextual analysis. Sternberg's theory of the three processes involved in contextual analysis underscores the importance of these individual variables and the complexity of the task of contextual analysis. He proposed that contextual analysis involves the selective encoding of only relevant information from the context, the combining of multiple cues into one definition, and the comparison of this new information with the reader's prior knowledge. These are certainly complex cognitive tasks.

The issue of the richness of the context deserves separate discussion because of the significance of this variable on the research that has been conducted. In much early research on contextual analysis, passages were developed specifically for research purposes with artificially rich contexts containing unusually explicit cues. McDaniel and Pressley (1989) referred to these as "embellished contexts." Raphael (1987) and Schatz and Baldwin (1986) suggested that, at best, natural contexts are not as rich as those developed by researchers and, at worst, are even misleading to the reader. It is very unlikely that students trained using artificially enriched contexts will be able to transfer contextual analysis to their own reading tasks in natural contexts.

There have been some promising studies that have trained students to use contextual analysis, and most of these studies have been conducted with students in the intermediate or middle school grades. In their study of middle school students, Buikema and Graves (1993) found that through extensive practice and direct instruction in context clues, experimental students were able to outperform the control group on measures requiring them to infer word meanings from context. In two similar, but separate, studies, Jenkins, Matlock, and Slocum (1989) and McKeown (1985) taught fifth-graders a method for inferring word meanings from context. Jenkins et al. determined that, when

given intensive instruction on the context strategy, students were able to infer word meanings on unfamiliar words based on context. McKeown found that simply instructing students to look around a target word's sentence for context clues was not sufficient. Students, especially those with low verbal abilities, needed to be taught the more elusive skill of selecting constraints from context and using multiple contexts. McKeown suggested that students lacked understanding of the relationship between words and contexts, encountered semantic interference when using more than one context, and missed the overall complexity of the meaning acquisition process. Thus, in this study, it appeared that the students with high verbal abilities were better able to use contextual analysis for vocabulary improvement than the striving readers.

We located only one study in which older students were trained to use contextual analysis. Sternberg (1987) investigated whether or not adults who were taught his theoretical framework of contextual analysis and trained to use it when reading, would improve their ability to derive meaning from context. The subjects were assigned to three teaching/training conditions: (a) the three processes involved in contextual analysis, (b) the individual variables that effect contextual analysis, or (c) the kinds of contextual clues. All of the trained subjects showed significantly greater post-test gains in their ability to derive meaning from context than the controls who received no training. These findings would suggest that training in the processes, the mediating variables, and the types of context clues can be valuable to students.

The training studies suggest that the efficacy of contextual analysis as a long-term vocabulary instruction method is still open for debate. In their recent book, Stahl and Nagy (2006) devoted an entire chapter to teaching students to learn from context, but they too cautioned that this approach is problematic and not overly effective. That is, contextual analysis is essentially a long-term process, as students are unable to integrate new word learning after simply encountering the word once. Instead, it may take them up to 10 exposures to the word (Jenkins et al., 1989) before they are able to fully acquire the word. Moreover, there is no definite evidence that students are able to transfer contextual analysis instruction to their actual natural reading tasks. This lack of transfer is striking because contextual analysis is often labeled as the "natural" method of vocabulary learning (Stahl & Nagy). McKeown and Beck (2004) have also noted that students may learn a few new history or physics words using contextual analysis, but this vocabulary knowledge develops slowly and thus is not particularly powerful for those who struggle with reading on a consistent basis.

Future researchers might consider addressing these two questions about contextual analysis: (a) What types of words are college students learning from context, and what are their methods for unlocking word meanings? (b) How can college reading professionals train students to transfer contextual analysis to their independent reading tasks? As researchers tackle these questions, they should attempt to use naturally occurring contexts that have not been embellished with explicit clues that are atypical of those that occur in expository textbooks.

Keyword studies

Mnemonic strategies, such as the keyword approach, have received considerable attention in the research. The *keyword method* was originally developed as a method for students learning a foreign language (Rough & Atkinson, 1975). In this method, students are taught to use associative learning to develop a mental image from a keyword or clue in the unknown target word in order to better remember that word. Another variation includes asking the students to place the keyword and definition into a meaningful sentence. For instance, if the target word is *astronomical*, a student might use the clue *astro* and then create a mental image of an astronaut who does exceedingly great things. The

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sentence the student might then create would be something like: The astronaut, who does exceedingly great things, is considered to be an *astronomical* person.

Paivio (1971) stated that mental imagery is important in facilitating long-term retention for adults because of the dual coding of organizational factors. Advocates of the dual-coding theory maintain that two different but interconnected symbolic processing systems exist for encoding information—one verbal and the other nonverbal. They propose that information is encoded in verbal, nonverbal, or both systems, depending on the task and the concreteness or abstractness of the words read. Abstract words are more likely to activate verbal codings, and concrete words are more likely to activate either nonverbal codings or a combination of both verbal and nonverbal systems. Other researchers have suggested that the associative imagery of the keyword mnemonic operates by linking or relating items so they form unified wholes or higher order units. Thus, when one item is recalled, that item acts as a retrieval cue for the other items that then regenerate the whole (Begg, 1973; Bower, 1972).

Several researchers have claimed that although the keyword method is indeed helpful for definition-remembering, it is only the first step in students' quest for deep processing of vocabulary (e.g., Hwang & Levin, 2002; McCarville, 1993; Scruggs & Mastropieri, 2000). In fact, McCarville (1993), in her study of college students, determined that the keyword method is useful to help students remember newly acquired words, but that other methods needed to be used to encourage deeper understanding and knowledge of the words.

In general, the research studies have concluded that college students who use the keyword method perform significantly better than the control subjects on numerous vocabulary measures (e.g., McDaniel & Pressley, 1989; Pressley, Levin, & Miller, 1981, 1982). This also appeared to be the case when Roberts and Kelly (1985) studied at-risk college students. While they found only slight differences favoring the keyword method on an immediate recall test, they did find significantly greater differences on a measure of delayed recall. Smith, Stahl, and Neel (1987) found similar results in their study of the keyword method.

Hall (1988) conducted two keyword method studies using regularly admitted college students. In these studies he attempted to replicate the natural learning environment, avoided picking target words that lent themselves to keyword associations, and asked students to generate their own keyword associations for each word. Hall concluded from his initial study that students performed better with multiple short exposures to words and that the keyword approach was not helpful for learning all word meanings. In a second experiment, Hall provided students with "easy" words that were conducive to keyword associations and "typical" words that did not readily suggest keyword associations. Surprisingly, there was little difference between the students and controls on learning the easy words, but the controls actually did markedly better than the students on the typical words. In the end, students said they preferred semantically linked mnemonic devices and would be more selective about their use of the keyword method in the future.

Although some of the findings have supported the efficacy of the keyword method, the studies do have some limitations. The most obvious limitation lies in the keyword method's lack of applicability to the real college classroom. Many of the words college professionals teach their students, as well as the words those students are encountering in their textbooks, are not conducive to keyword associations. Researchers of the keyword method are often using concrete, three syllable, low-frequency nouns with concise definitions (Pressley et al., 1981, 1982). Another limitation of the method is the time factor involved in learning words from this method. If a strategy is to be effective, students must be able to use it quickly and independently. Stahl, Brozo, Smith, Henk, and Commander (1991) explained that students had trouble independently generating their

own keyword associations from new words they were learning in the college classroom. In addition, Hall (1988) found support for shorter spaced exposures to words, thereby supporting the notion that the time needed to learn keyword associations might not be worth the investment. A final limitation to the keyword method is that there has not been any research into whether or not students can and will transfer the method into their independent learning.

In the future, researchers should make sure that they are embedding the keyword method in realistic settings so they can answer this significant question: What would happen if college students were given a list of words without the corresponding key words and asked to learn the words as efficiently as possible? Researchers might also query students about their evaluation of the keyword method and its utility in their academic lives.

STUDIES ON CONTENT-SPECIFIC VOCABULARY STRATEGIES

Content-specific vocabulary knowledge is especially important for college students who are delving deeply into different areas of study and are being asked to comprehend challenging text in those areas. This fits especially well into the *knowledge hypothesis* of vocabulary learning (Anderson & Freebody, 1981). The knowledge hypothesis suggests that vocabulary should be taught within the context of learning new concepts so that new words can be related to one another and to prior knowledge. Thus, the source for words to be taught or studied is not teacher-made word lists, but the difficult or unknown words that are critical for students' comprehension of specific content area reading assignments. Stahl and Nagy (2006) made the distinction that the *knowledge hypothesis*, as differing from the *instrumentalist hypothesis*, assumes that students know a word because of the concepts behind that word, not just because they learned the word itself. Therefore, the more knowledge students have about a concept, the better able they are to comprehend the material and, as a consequence, the words surrounding the concept.

Some of the strategies previously discussed—particularly those related to contextual or morphemic analysis—could be used by students to comprehend challenging content-specific words. However, the strategies examined in this section are different from the traditional word knowledge strategies in that their main goal is to increase students' comprehension of content area information and concepts.

Many of the research studies that have examined content-specific vocabulary improvement have focused on improving college students' reading comprehension instead of improving their vocabulary. Of the studies we located that focused on vocabulary improvement, there seemed to be a trend supporting the argument that these strategies can assist students in learning vocabulary and concepts across a variety of content areas. These content-specific strategies include basic visual organizers and more elaborate matrix displays.

Basic Visual Organizers

There are many names for visual organizers—structured overviews, concept maps, semantic maps, and graphic organizers—but they are all intended to demonstrate the relationship between vocabulary terms and new or known concepts. While some visual organizers highlight text organization and others help students understand main ideas, most can trace their origin to Ausubel's (1963) theory of meaningful receptive learning. Ausubel suggested that students can learn content area vocabulary more effectively if

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college classroom. They can connect previously learned concepts with new concepts and that one strategy for strengthening students' existing cognitive structures is the advanced organizer. The benefit of visual organizers is that they can be teacher-directed or student-developed and can be completed before or after reading.

A variety of studies have been conducted to evaluate the effects of visual organizers on students' learning of words from text. In a meta-analysis of 16 studies, Moore and Readence (1980) asserted that only 2% of the variability in text learning could be explained by the use of organizers. However, the researchers did point out that the benefits of visual organizers were more pronounced when the organizers were used as a post-reading strategy and when vocabulary was included as the criterion variable. It is important to note that since Moore and Readence's time-honored meta-analysis, several studies have concluded that using visual organizers significantly improved students' comprehension (e.g., Bernard & Naidu, 1992; Hoffman, 2003; McCagg & Dansereau, 1991).

Unfortunately, we found a limited number of studies pertaining to college students, basic visual organizers, and vocabulary development. In the studies we did find, the students were either given a completed visual organizer or were asked to finish a partially completed visual organizer after reading a text excerpt. In one study, Pyros (1980) investigated the impact of researcher-provided visual organizers on students' vocabulary knowledge. The control group was given a list of words and definitions, while the experimental group was trained for one hour on the purpose and function of the advance organizer. After both groups read selections from psychology and economics texts, Pyros concluded that there were no significant differences between the two groups on immediate and delayed vocabulary measures.

In contrast, Barron and Schwartz (1984) and Dunston and Ridgeway (1990) offered their students either researcher-constructed or partially-completed visual organizers as a post-reading strategy. The graduate students in Barron and Schwartz's study who were required to finish the partially completed organizer did significantly better on the vocabulary relationship test than the other group who was simply given a list of words and definitions. However, when Dunston and Ridgeway sought to investigate the impact of researcher-constructed organizers and partially constructed organizers on college freshmen's performance on a chapter test, they reported no significant difference between the treatment conditions. This finding is not all that surprising considering the lack of training and the limited 70-minute time frame of the study. Nevertheless, graphic organizers have been found to be effective for reading comprehension (cf., Holschuh & Aultman, this volume).

Elaborate Matrix Displays

In an effort to improve visual organizers, some researchers have combined organizers with other types of vocabulary activities that include nodes, links or personal associations, and spatial displays. For example, Carr and Mazur-Stewart (1988) developed the Vocabulary Overview Guide (VOG) and constructed a study to examine its usefulness. The study asked students to create their own personal clues for related vocabulary words and then required them to monitor their understanding of the words. The findings indicated that the VOG group performed significantly better on the immediate and delayed vocabulary tests than the control group who read a passage, underlined unknown words, and used context clues for word meanings.

Diekhoff, Brown, and Dansereau (1982) took another approach, developing The Node Acquisition and Integration Technique (NAIT), a matrix based primarily on network models of long-term memory structure (Collins & Loftus, 1975; Rumelhart,

Lindsay, & Norman, 1972) and the depths of processing approach described by Craik and Tulving (1975). The NAIT strategy was designed to help students systematically select and define key concepts, consider examples and applications, and identify existing relationships among the concepts.

The strategy has four basic stages. In Stage 1, the students are asked to identify key concepts or important terms they need to learn within a text. During the second stage, students use relationship-guided definitions to construct a semantic network around each of the selected key concepts. In Stage 3, the elaboration stage, students think of examples or potential applications of the key concepts and record these examples. During the fourth and final stage, students identify meaningful similarities and differences among the different concepts being studied.

Diekhoff et al. (1982) tested NAIT for effectiveness with undergraduate students. The experimental group received 3 hours of NAIT training that utilized passages from biology, geography, and geology. Two days after the training, both the experimental and control groups received two passages from an introductory psychology textbook to study for 60 minutes. The experimental group was told to use the NAIT technique, whereas the students in the control group were told to use any of their own learning techniques. Following the study period, all passages and worksheets were collected from both groups. One week later, both groups were given a 30-minute essay test on the passages. The test required students to define and discuss five experimenter-selected key concepts in as much depth and detail as possible and to make comparisons among pairs of words selected by the researcher. The experimental group performed significantly better than the untrained control group on both measures, supporting the effectiveness of the NAIT approach.

Other researchers have capitalized on Diekhoff et al.'s findings and recommendations (e.g., Chmielewski & Dansereau, 1998; Kiewra, 1994; O'Donnell, Dansereau, & Hall, 2002). For example, Chmielewski and Dansereau sought to determine whether knowledge mapping improves the manner in which students interact with expository text. In their first experiment one group of students was trained to construct and evaluate maps while the control group completed a variety of assessment measures. Five days later the two groups took a free recall test that was scored using a propositional analysis. Although the free recalls were low for both groups, the trained participants recalled significantly more macro-level information. In a second study the trained group recalled significantly more macro and micro-level information.

These research studies suggest that basic visual organizers and matrix displays can positively affect students' comprehension of expository text, especially for those students who have low verbal ability or low prior knowledge of the information. Recent articles have affirmed that visual organizers are effective for secondary students (e.g., Greenwood, 2002; Harmon et al., 2005; Rupley & Nichols, 2005), but it appears that both of these content-specific vocabulary strategies need to again be studied at the college level. Possible avenues for future research might include investigating whether or not students choose to create organizers or matrices when learning content area concepts, especially after they have been trained in how to create them.

STUDIES ON STUDENT-CENTERED APPROACHES

Some researchers have examined instructional approaches that capitalize on students' interests or beliefs in order to enhance their word knowledge. The studies in this section focus on providing college students direct experiences when learning new words, allowing students to decide which vocabulary words they will learn, and understanding students' belief systems of what it means to know a word.

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Concrete, Direct Experiences

Over 35 years ago, Petty, Herold, and Stoll (1968) conducted a review of 50 vocabulary studies and concluded that providing direct experiences in using a word is extremely important to building students' vocabulary. More recently, other researchers (e.g., Blachowicz & Fisher, 2004; Rupley & Nichols, 2005) have concurred with Petty et al., suggesting that teachers can enhance students' vocabulary knowledge by providing on-the-spot experiences with the word followed by rich discussions of the word and its context. For example, Goerss, Beck, and McKeown (1999), in their study of a vocabulary intervention with fifth- and sixth-graders, determined that striving readers are more likely to acquire new words when they encounter vocabulary instruction that draws on their prior knowledge and encourages them to practice the new words and make connections to other words.

The previously mentioned studies were primarily geared at younger students, but there are a few research studies that have investigated the relationship between direct, concrete experiences with concepts and college students' vocabulary improvement. In one such study, Duffelmeyer (1980) examined the impact of providing experiences with new words by asking 56 college students to act out investigator-prepared skits. The skits were constructed from words used in the comprehension section of the Nelson-Denny Reading Test (Brown, Nelson, & Denny, 1976). After each presentation, the researcher asked the students about the targeted words. In addition, students were required to provide a personal experience that explained the meaning of the word. The experience-based group significantly outperformed the traditional group on the post-exam. Duffelmeyer concluded that college students can indeed benefit from an experience-based approach to vocabulary learning. However, it should be noted that this approach is limited because it requires a large time commitment, and there is no evidence that it will lead to independent transfer.

Students' Input in Selecting Words

There have been some research studies that have suggested that students' motivation to learn new words can be enhanced when they are the ones selecting the words to be studied (e.g., Francis, 2002; Rupley & Nichols, 2005; Scott & Nagy, 2004). In one study, Haggard (1980) found that elementary and middle school students learned new words because they were immediately useful or had some particular significance. In 1986, Haggard replicated that study with college students to see if the same motivational factors played a role in vocabulary growth. The college students in the study logged their vocabulary development in their journal. Haggard found that students reported needing to use the word to be successful in class as the number one reason for selecting a word. The second most commonly cited reason for choosing a word was the need to clarify the meaning. Not surprisingly, 40% of the words students chose were related to their content-area learning. Haggard concluded that choosing their own words can significantly increase students' motivation and desire to expand their vocabulary in both the content-areas and in general.

Gnewuch (1974) also conducted a study of college students' use of a self-collection method to improve vocabulary learning. The experimental group was asked to find words in their reading that were vaguely familiar. The students wrote the words in the context in which they found them, then guessed at the meanings, and finally checked their guesses with the dictionary definitions. At the end of the study, the experimental group outperformed the control group, who received no additional vocabulary instruction, on a standardized reading assessment. The limitation of the Gnewuch study is that the control group did not study a list of words provided by the instructor, which would have more decidedly demonstrated the motivational factor of this method.

In a recent attempt to confirm earlier studies, Ruddell and Shearer (2002) used the Vocabulary Self-Collection Strategy (VSS) to study seventh- and eighth-grade students' reactions to the method as a means of vocabulary growth. With the VSS method, students are asked to choose words that they think everyone in the class should learn and know, and those words become the targeted list of vocabulary words. Ruddell and Shearer exposed 17 at-risk middle school students to VSS and measured their ability to perform on weekly spelling and meaning generation assessments. The students' scores were significantly better on the tests of the VSS lists than on the tests of the vocabulary lists given by the instructor. The study's findings supported previous research in that students were more engaged and motivated by learning words they found meaningful and useful to future study.

Although Haggard's (1986) and Gnewuch's (1974) studies investigated college students' reactions to the self-collection method, Ruddell and Shearer (2002) demonstrated the difference between students' learning of a self-collected list of words and a list provided by the instructor, albeit with younger students. The limitation of the Ruddell and Shearer study is that the number of words on the VSS list was less than the number of words on the instructor-given list. However, the results from all these studies are intriguing enough to warrant a call for more research on the self-collection method with college students, especially since a recent study (Harmon et al., 2005) suggested it as a means of improving students' content-area knowledge and comprehension.

Students' beliefs about vocabulary knowledge

The research into students' epistemological beliefs has been varied, leading researchers to focus on both general beliefs about learning and domain-specific beliefs (science, math, etc.). Some of the studies (e.g., Schommer-Atkins, 2002; Schommer, Calvert, Gariglietti, & Bajaj, 1997) examined college students' general beliefs about learning and how those beliefs evolved over time. Other, more recent, studies have tackled students' domain-specific beliefs. For example, Buehl, Alexander, and Murphy (2001) sought to investigate the domain specificity of beliefs, so they developed the Domain-Specific Beliefs Questionnaire (DSBQ) that focused primarily on mathematics and history beliefs.

Harmon (1998) was the first to investigate the connection between students' beliefs and their vocabulary knowledge. In her study, middle-school students were asked to engage in the think-aloud procedure as a method to determine their perceptions of word meanings. Her findings indicated that some students were unaware of appropriate processes that could uncover the best contextual meaning of a word. While this study did not provide any direct questioning of the students' beliefs about vocabulary knowledge, the descriptions students used to recount the vocabulary acquisition process hinted at their underlying belief systems about the uncertainty of vocabulary knowledge.

Francis and Simpson (2003) also examined the relationship between students' beliefs about vocabulary knowledge and their acquisition strategies. The study's findings did not uncover a strong link between beliefs and vocabulary acquisition strategies, but the researchers did confirm a connection between students' reading comprehension scores and their vocabulary knowledge. The connection between reading comprehension and vocabulary knowledge is well-documented in the research (RAND Reading Study Group, 2002; Stahl & Nagy, 2006), but Francis and Simpson emphasized that further inquiry into vocabulary beliefs might be better served by using mixed methodology and multiple data sources.

Francis (2006) followed up on the 2003 study with her research that investigated whether or not there was a change in college students' beliefs about vocabulary knowledge after one semester in a biology course. The study used a mixed methodology, and

while the quantitative data suggest that the students who used the method to clearly identify their own words acquired new words more quickly than those who did not, their knowledge is still in

RECOMMENDATIONS

Most individuals who have used the self-collection method, material, and process. However, it is possible to use the method in a variety of ways and practices. The following are some recommendations: (a) use the method in a variety of settings; (b) use the method in a variety of settings; (c) use the method in a variety of settings; (d) use the method in a variety of settings; (e) use the method in a variety of settings.

Provide students with opportunities to use the self-collection method

Vocabulary development is a complex process that involves students in a variety of ways. Some individuals have used the self-collection method as "generative." This method allows students to generate their own words, which they will be able to use in a variety of ways. The additive approach to vocabulary learning involves expanding students' vocabulary through the use of the self-collection method. Given the importance of vocabulary in a variety of settings, the generative approach is a valuable strategy (Edwards & Simpson, 2003).

We are not suggesting that the self-collection method be used as a direct instruction strategy. Instead, we suggest that instructors should use the self-collection method as an additive and generative strategy. This strategy may see students using the self-collection method to generate their own words, which they will be able to use in a variety of ways. This strategy may see students using the self-collection method to generate their own words, which they will be able to use in a variety of ways. This strategy may see students using the self-collection method to generate their own words, which they will be able to use in a variety of ways.

Teach vocabulary strategies

Researchers who have used the self-collection method have concluded that vocabulary knowledge is a complex process that involves students in a variety of ways. This study suggests that the self-collection method is a valuable strategy for expanding students' vocabulary knowledge. This study suggests that the self-collection method is a valuable strategy for expanding students' vocabulary knowledge.

while the quantitative data did not detect a significant change in students' beliefs, the qualitative data suggested that something significant happened during that semester for the students who were interviewed. That is, the majority of the students were unable to clearly identify the methods that the instructor used to teach them how a biologist acquired new words, but they did acknowledge that vocabulary was an important factor when learning biology. At this point in time, the area of beliefs about vocabulary knowledge is still in the infancy stage of research.

RECOMMENDATIONS FOR VOCABULARY INSTRUCTION

Most individuals would agree that the extant literature has not validated any one method, material, or strategy for enhancing college students' vocabulary knowledge. However, it is possible to delineate the characteristics of effective vocabulary programs and practices. The following seven guidelines, gleaned from a variety of research studies, should be considered when planning vocabulary lessons: (a) provide students a balanced approach; (b) teach vocabulary from a context; (c) emphasize students' active and informed role in the learning process; (d) stimulate students' awareness and interest in words; (e) reinforce word learning with intense instruction; (f) build a language-rich environment to support word learning; and (g) encourage students to read widely.

Provide students a balanced approach

Vocabulary development involves both the "what" and the "how." The "what" focuses on the processes involved in knowing a word. The "how" is equally important because it involves students in learning strategies for unlocking word meanings on their own. Some individuals have referred to the former approach as "additive" and the latter approach as "generative." Think about it this way: If students are taught some words from a list, they will be able to recognize and add those particular words to their repertoire (i.e., the additive approach). However, if students are taught a variety of independent-word learning strategies, once they leave the college reading classroom they will be able to expand their vocabulary and generate new understandings of text (i.e., the generative approach). Given the enormous amount of words that struggling readers do not understand, the generative approach seems to make considerable sense, especially in college settings (Edwards, Font, Bauman, & Boland, 2004; Simpson et al., 2004).

We are not suggesting, however, that college reading professionals discontinue the direct instruction of important words and concepts. Instead, we make the point that instructors should implement a balanced vocabulary program that emphasizes both the additive and generative approaches. Although both additive approaches and generative strategies may seemingly appear in many commercial materials, how the activities are designed actually determines the approach. That is, there is a difference between asking students to use their knowledge of morphemic analysis to determine the meaning of difficult or unknown words and asking students to use morphemic analysis to complete multiple-choice exercises using words like *transportation* or *photography*. Given these constraints and realities, college reading instructors should carefully scrutinize all classroom activities and ask themselves what is being taught.

Teach vocabulary from a context

Researchers who have reviewed the literature on vocabulary instruction have concluded that vocabulary is best taught in a unifying context (Fisher & Blachowicz, 2004; Simpson et al., 2004). Words taught in the context of a content area will be learned

more effectively than words taught in isolation because context allows students to integrate words with previously acquired knowledge (Marzano, 2004). The implication, of course, is that students will not improve their long-term vocabulary knowledge and understanding by memorizing the definitions to words that have been listed in commercial materials (Joshi, 2005).

Rather than relying on lists of words, college reading professionals should target words from materials that students are reading, whether it be textbooks, magazines, or novels. Students can even select the targeted words on their own. For example, a student may choose *acrimonious* from a sociology textbook and *discordant* from a history novel. As noted by Biemiller (2001), the words students find in their own reading contexts are often generalizable to other reading situations. For instance, words such as *postulate*, *synthesis*, and *fluctuate* could all be target words chosen from a biology chapter, but could also appear in a novel or magazine article. Whatever the context, it is important to acknowledge that students gain the most from vocabulary instruction that is placed within authentic tasks. Students must feel the words to be learned are meaningful and useful, not chosen at random by the instructor.

Emphasize students' active and informed role in the learning process

The importance of students' active participation and elaborative processing in learning new words is a consistent theme across the research literature (Fisher & Blachowicz, 2005; McKeown & Beck, 2004; Rupley, 2005). Elaborative or generative processing engages students in activities such as: (a) sensing and inferring relationships between targeted vocabulary and their own background knowledge; (b) recognizing and applying vocabulary words to a variety of contexts; (c) recognizing examples and nonexamples; and (d) generating novel contexts for the targeted word. When students have an informed role in vocabulary development, they understand the declarative and procedural requirements of learning new words (Nagy & Scott, 2000). That is, they have the declarative knowledge that allows them to define a word and the procedural knowledge that allows them to do something with the words in other contexts.

Unfortunately, it appears that most commercial materials do not actively engage students in their own learning, treating them instead as simple receptacles of massive word lists (Joshi, 2005; McKeown & Beck, 2004). When students circle letters or draw lines to match a definition to a word, they are passively involved in guesswork. Even asking students to write a definition of a word from memory does not stimulate conceptual understanding. If commercial vocabulary materials must be used with students, they should be modified or supplemented in several ways. For example, instructors could ask students to explain their particular answers to questions and encourage them to relate the words to their own personal experiences. Another strategy might be to take students' misconceptions about words and challenge them through discussion and further investigation (Blachowicz & Fisher, 2000). This strategy might be most successful in math or science courses where it is easier to identify students' misconceptions about concepts and the words that surround them.

College reading professionals can also facilitate students' active and informed processing when they incorporate into their classroom routines a variety of creative formats for practice and evaluation. Francis and Simpson (2003) have described a variety of these formats, many of which are quite easy to design. For example, one such format is called the paired word question (Beck & McKeown, 1983) that pairs two targeted vocabulary words (e.g., would *melancholy* make you *doleful*?). To answer these paired word questions, students must understand the underlining concepts or words and then determine if any relationships exist between them. The exclusion technique is another creative format for practice and evaluation (Francis & Simpson). With the exclusion

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format, students are given three or four words and are asked to determine the one word that does not fit and the general concept under which the other words are categorized. For instance, if students were given the words *philanthropy*, *magnanimousness*, and *malevolence*, they would have to know the definitions for all three words and know that *malevolence* does not fit because the others are terms describing generosity of spirit.

Stimulate student awareness of and interest in words

The importance of student interest as a means of improving attention, effort, persistence, thinking processes, and performance is well documented (Hidi & Harackiewicz, 2000). However, the fostering of the relationship between interest and vocabulary knowledge is not practiced as often as it should be. Most students find looking up the definitions for a list of words boring and irrelevant to their own areas of study. Instead, we, as college reading professionals, should be crafting strategies and situations that foster student interest in and transfer of new words.

One such strategy is the VSS strategy outlined by Haggard (1986) and further supported by the study by Harmon et al. (2005) of students' self-selection methods. With this strategy, students are told to bring to class two words they encountered in their lives (via television, peers, or reading). The teacher also selects two words, and all the words are written on the board. Through discussion, students narrow down the choices to a predetermined number of words. Those are the words that the entire class learns. Harmon et al. (2005) stated that students of all ability levels can self-select important words and that this method allows for more diverse word lists.

In a modification of the VSS, Francis' (2002) students self-selected words from the novels they were reading in class. The words then became the designated word lists for the two weeks, with more active and elaborative assessments at the end. The benefit of such a strategy is that students are learning words that are directly useful to their reading and words that are generalizable to other reading situations.

One final note about student interest is the necessity of teacher interest in words. As Manzo and Sherk (1971) so aptly stated, "the single most significant factor in improving vocabulary is the excitement about words which teachers can generate" (p. 78). In other words, college reading professionals should be playful with words and exhibit enthusiasm for words. We can accomplish this by using new and interesting words during class discussions, in our email correspondences, and when responding to our students' work. When students can see how exciting and intriguing word learning can be, they are more likely to gain back their own inherent excitement about learning. Moreover, when teachers encourage students to play with words and manipulate them, students are learning to take a "metalinguistic stand" on vocabulary, a stance that builds flexibility and confidence (Fisher & Blachowicz, 2005).

Reinforce word learning with intense instruction

Students' word knowledge takes time to develop and increases in small, incremental steps (Scott & Nagy, 2004). Although it is impossible to identify a specific time frame for all students, we do know from the research literature that word ownership is reinforced when students receive intense instruction characterized by multiple exposures to targeted words in multiple contexts (Marzano, 2004; Rupley & Nichols, 2005). We need to remember, however, that duration is not the only critical characteristic of intense vocabulary instruction. Mere repetition of a word and its definition over time is not beneficial unless students are actively involved in elaborative processing. Intense instruction without active student involvement can be boring and counterproductive to the goals of an effective vocabulary development program. Thus, it is also imperative

that our vocabulary instruction include a variety of discussions and expressive activities that encourage students to question and experiment with new words, reinforcement and practice activities that require students to think and write rather than circle answers, and cumulative review activities that provide students with repeated exposures over time (Greenwood, 2002; Simpson et al., 2004).

Implicit within the intense model of instruction is the reality that fewer words are taught, but in greater depth. The words selected for instruction, either by the students or the teacher, should be of high utility and relevance to learning across the academic disciplines. It is always a joy to watch students' excitement and surprise when they encounter their newly acquired words in sociology lectures or psychology textbooks. That excitement is something we should encourage, and strive for, as we continue to develop our vocabulary programs.

Build a language-rich environment to support word learning

The findings from research studies suggest that students with strong expressive and receptive vocabularies are the ones who are immersed in environments characterized by "massive amounts of rich written and oral language" (Nagy & Scott, 2000, p. 280). Instructors can best promote vocabulary growth by working with students to create an environment where new words are learned, celebrated, and used in authentic communication tasks (Blachowicz & Fisher, 2004; McKeown & Beck, 2004). Students should be provided opportunities to experiment with using words in low-risk situations. In our classes, for example, students are sometimes asked to construct sentences using a targeted word as a way of gaining access to the classroom for that particular day. Such oral language activities allow students to learn not only how vocabulary words function, but also how different sentences are constructed using multiple parts of speech. This word play is essential to students' metalinguistic understanding of the words and increases their motivation to learn new words (Blachowicz & Fisher, 2004).

Another strategy that helps students acquire new words in a language-rich environment is to include discussions about word learning (Francis & Simpson, 2003). During these discussions, teachers and students should openly work together to determine what generative strategies would be appropriate for specific words. These discussions might also include *why* strategies are appropriate or inappropriate for a given word or groups of words. For instance, students may have a difficult time creating a visual organizer for an unknown word, but another strategy, such as imaging, might work better. These discussions and dialogues help students understand the versatile nature of vocabulary learning.

Once students become comfortable with a set of new words in their oral language vocabularies, instructors can then reinforce their learning by providing regular writing activities. This frontloading of oral language activities is important because of the gap between students' expressive and receptive vocabularies (Joshi, 2005). Many students, especially the striving readers, create tangled and inappropriate sentences using their new vocabulary words because they have not received sufficient oral language activities to prepare them for their writing tasks. Moreover, it is important that these writing activities invite students to write purposeful and meaningful texts that demonstrate their understanding of important concepts (McKeown & Beck, 2004).

Encourage students to read widely and frequently

As noted by a variety of researchers, students who choose to read widely and frequently have the breadth and depth of word knowledge necessary to understand their content-area textbook assignments (Harmon et al., 2005; Joshi, 2005). This ability to cope successfully with content-area reading tasks occurs because students who read widely

are more likely to use their knowledge, their background from comprehensive reading in Reading (Donahue) students who reported higher achievement test scores.

The implication for us to understand what we are teaching our learners, we must encourage our classrooms (Grant) not as important as we think works or classics with discussions. Rather than discussions encourage the use of newspapers, magazines can hook their students using supplemental materials selections (Brozo & Beck) brief amount of time to highlight important information as it may seem, correct.

The aforementioned strategies providing a systematic approach relying on commercial materials discuss some of the

FUTURE AVENUES

After examining the data that there are three areas in the future. These areas are vocabulary program, writing of commercial materials, and ignored areas.

Analyzing present data

Perhaps the most important is to take the time to analyze the data and ask the right questions that

1. Does the present data indicate that the generative approach to vocabulary strategies appropriate?
2. Does the present data indicate sensitivity to word learning on a long-term basis?
3. Does the present data indicate what it means to use the data?
4. Does the present data indicate and evaluation?

are more likely to increase their awareness of new words, their depth of vocabulary knowledge, their background knowledge, and their reading fluency. Moreover, findings from comprehensive studies such as the National Assessment of Educational Progress in Reading (Donahue, Voelkl, Campbell, & Mazzeo, 1999) have indicated that the students who reported that they read frequently and widely were the ones who had higher achievement test scores.

The implication for college reading professionals is obvious: If we want our students to understand what they read in our courses and to become successful independent learners, we must encourage them to read beyond what they are assigned to read in our classrooms (Graves, 2004). We should also keep in mind that what students read is not as important as the fact they are reading. Forcing students to read the "important" works or classics will not instill a love of reading and may, in fact, cause negative reactions. Rather than focusing exclusively on the classics, many college reading professionals encourage their students to read on a daily basis, suggesting materials such as newspapers, magazines, or popular novels. Other instructors have discovered that they can hook their students into recreational reading by bringing into the classroom intriguing supplemental materials such as newspapers and magazines and reading aloud brief selections (Brozo & Simpson, 2007). Labeled the "reading minute," this activity uses a brief amount of time to discuss the content (e.g., the death of diet guru Atkins) and to highlight important words that might be useful to students (e.g., metabolism). Surprising as it may seem, college students do enjoy activities such as these.

The aforementioned seven guidelines should assist college reading professionals in providing a systematic and comprehensive vocabulary program for students rather than relying on commercial materials to dictate their program. In the next section we will discuss some of the future avenues that college reading professionals could consider.

FUTURE AVENUES

After examining the extant literature on vocabulary improvement, we have determined that there are three major challenges that college reading professionals should tackle in the future. These challenges include (a) analyzing, in an objective manner, present vocabulary programs and practices; (b) providing on-going feedback to editors and writers of commercial materials; and (c) conducting useful research, especially in often ignored areas.

Analyzing present vocabulary programs and practices

Perhaps the most important challenge that college reading professionals can tackle is to take the time to analyze and evaluate their present programs and practices. Some possible questions that could be used for an objective evaluation include:

1. Does the present vocabulary program offer a balance between the additive and generative approaches to vocabulary development? Does the program offer a variety of strategies appropriate for individual learning styles?
2. Does the present vocabulary program help students develop an appreciation and sensitivity to words so they will continue to develop their personal vocabularies on a long-term basis?
3. Does the present program provide direct instruction that takes into consideration what it means to know a word fully and flexibly?
4. Does the present vocabulary program use a variety of oral and written activities and evaluation measures?

5. Does the present vocabulary program have specific goals that match the characteristics of the students? Does this program reflect the academic literacy tasks that students will encounter during their college career?

The results of such an evaluation should be shared with others, as well as the checklist or questions used during the evaluation. Vocabulary, as we mentioned earlier in this chapter, is one of the five essential components of reading and thus certainly deserves our attention and objective critique.

Providing on-going feedback to editors and writers

The second challenge for college reading professionals is to provide on-going feedback to the editors and writers of commercial materials concerning the relevance and quality of their products. College reading professionals must not accept without question what publishers disseminate. They need to examine materials in light of their own specific needs, keeping in mind what research has said about effective vocabulary instruction. As Stahl et al. (1987) concluded in their content analysis, the materials on the market tend to be based on tradition rather than on research-supported principles. The critical link between researchers and publishers is the instructor. Consequently, we highly recommend that college reading professionals offer informed, objective, and constructive opinions on materials they receive from publishers and that they take the time to chat with publishers who attend professional conferences and set up displays of commercial materials.

Conducting useful research

Given the dearth of studies that have asked useful and relevant questions about vocabulary development at the college level, the final challenge for college reading professionals is to conduct research with their own students. The process could begin with valuable descriptive studies that attempt to answer significant questions, such as how students acquire general and technical vocabularies, especially in content areas such as biology or chemistry.

Another viable research avenue should be the continuation of research on vocabulary learning by students who speak English as a second language. Interestingly, most of the more recent studies have been in this area. For example, the study by Carlo et al. (2004) examined the steps necessary for substantial vocabulary growth by English-language learners. Carlo et al.'s study was a 15-week intervention involving direct instruction of targeted words and word-learning strategies. Drawing on what we know about teaching vocabulary to students who speak English as their first language, the researchers recommended that teachers of English-language learners draw attention to academic words, instruct students on methods for deciphering word meanings from context, and allow students to play with words in their own contexts.

As to other possible research questions that should be addressed, our main suggestion is to avoid studies that seek to determine a superior strategy. After suffering through countless studies comparing one strategy to another, we should acknowledge what theory and research has already told us—there is no magic answer to long-term and lasting vocabulary development.

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Although basic : 1910; James, 189 prehension until "knowledge that (p. 8). More rec cognitive, devel on self-regulatec 2003). Although of the processes suggestion that edge, processes, deliberately moi tive states" (p. 1