Using Explicit Instruction to Promote Vocabulary Learning for Struggling Readers

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Research supports the need for active vocabulary learning across grade levels and subject areas to help increase readers' comprehension of diverse texts that they encounter. Given the increasing emphasis on decoding and reading comprehension, the relative importance of vocabulary instruction has been diminished in recent years. The authors argue that explicit support for vocabulary is an important aspect of reading instruction across the primary- and secondary-grade levels. Explicit vocabulary strategies for classroom use are included.

I think science has some hard reading. It might just be that I don't understand science all that well, but it uses a lot of big words and scientific language that I guess the teacher understands. [The textbook] gives some pretty good explanations of some things and like some diagrams, but I'd have to say that's the hardest reading.—Kaitlyn, on reading in science.

[Science has] a lot of language, a lot of vocabulary. It's just prefixes and suffixes and things like that... You don't realize how much time I spend trying to hammer home basic vocabulary.—Clarence Edwards, biology teacher.

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Kaitlyn, a 10th-grade student, and Clarence Edwards, a biology teacher at Kaitlyn’s school, recognize the challenges vocabulary poses to students in content area classes. Kaitlyn’s comments suggest that in spite of the best efforts of educators, students struggle with vocabulary and concept learning in content area classrooms. Edwards’s comments pose a similar challenge to teachers in supporting students in learning new vocabulary. We seek in this article to address the challenge of teachers to help students better learn key vocabulary in content area classrooms by providing a rationale for the explicit teaching of strategies to support student learning of concepts and vocabulary. We offer specific strategies that we, as teachers and teacher educators, have found useful in our classrooms and those of our colleagues.

Vocabulary knowledge is a vital component of reading comprehension (Anderson & Freebody, 1981). The development of students’ vocabulary knowledge further facilitates successful comprehension of a variety of texts (R. A. Thompson, 1999), which in turn increases their vocabulary knowledge. Students should be engaged in learning new words and expanding their understanding of words through instruction that is based on active processing. Students must go beyond just memorizing definitions to integrating word meanings into their existing knowledge in order to build conceptual representations of vocabulary in multiple contextual situations (Nichols & Rupley, 2004).

The groundwork of word-meaning learning is the continuous development of language ability. Readers and writers share and acquire meanings for words through both direct and vicarious experiences that create and refine meaning vocabulary (Blachowicz & Fisher, 1996). As students expand their experiential and conceptual backgrounds, they also expand and refine their knowledge of words. Even though experiences in natural language environments no doubt enhance vocabulary development (Cho & Krashen, 1994; Nagy & Herman, 1996), it is our belief that thoughtful and well-planned instructional strategies can also help learners develop their vocabulary and increase their ability to comprehend text.

According to Nagy (1988), traditional definition- and context-based approaches to teaching vocabulary are not especially effective for learning vocabulary or improving comprehension. Biemiller (2001) argued that vocabulary instruction in schools has been crowded out by other instructional demands, such as increased attention on decoding, for instance. He contended that vocabulary instruction should begin early, span across the grade levels, and be taught directly.

The relative importance of explicit vocabulary instruction has been eclipsed in recent years by reading comprehension and decoding.

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1Kaitlyn and Clarence Edwards (pseudonyms) participated in a study of the kinds of reading encountered by 10th-grade students in high school in the midwestern United States conducted by one of the authors.
Vocabulary instruction has not received attention as a "hot topic" in surveys conducted by the International Reading Association (Cassidy & Wenrich, 1998-1999; Nagy & Scott, 2000) and has received less attention in reading journals (Rupley, Logan, & Nichols, 1999). Some have pointed out that an emphasis on methods for achieving effective vocabulary instruction has declined, even though research supports the contention that inadequate vocabulary knowledge exacerbates learning difficulties faced by already disadvantaged students (Manzo, Manzo, & Thomas, 2006). However, research also suggests that explicit support for vocabulary learning can help less skilled readers learn new and challenging vocabulary (Coyne, Simmons, Kame‘enui, & Stoolmiller, 2004; Goerss, Beck, & McKeown, 1999) and is vital for second language learners (Lee, 2003). Moreover, explicit support for vocabulary aids students in learning content-specific concepts (Monroe & Orme, 2002) and can improve students' instructional reading level (Gauthier, 1991).

Research (Goerss et al., 1999) also supports the notion that, in order to learn and retain new vocabulary, students need to be involved in active learning that requires them to make associations between word learning and their experiences, as well as opportunities to practice, apply, and discuss their word knowledge. Students need to go beyond memorizing definitions. They must be taught strategies that will allow them to integrate new word meanings with their existing knowledge in order to build strong conceptual representations of vocabulary across multiple contextual settings. As students expand their experiential and conceptual backgrounds, they will also expand and refine their knowledge of word meanings.

Explicit instructional activities that visually display new words while allowing students the opportunity to compare and contrast these new words to already known words, can provide a beneficial means for increasing the vocabulary knowledge of struggling readers (Nichols & Rupley, 2004). Biemiller (1999) noted that students can learn two to three new words a day when instructional learning strategies are based on active processing and are applied in a meaningful context.

In this article we argue that explicit instruction should not simply rely on traditional definition- or context-based approaches, which tend to be passive, but should foster active engagement and word study on the part of students. We offer several effective strategies that will help students like Kaitlyn and their teachers who want to promote active vocabulary and concept development in content area classrooms. We also believe that explicit teaching of vocabulary has a clear pedagogic component. That is, explicit vocabulary instruction involves the teacher, who must go beyond naming or providing a long list of words to be learned by students in a unit of study and instead provide appropriate instruction to facilitate learning. For instance, we include the Vocabulary Self-Awareness Chart (Goodman, 2001) as a vehicle to involve students in active vocabulary learning, but we
stress that teachers should further help students by teaching these concepts and terms by pairing the Vocabulary Self-Awareness Chart with concept maps or semantic feature analysis (Anders & Bos, 1986). We organized this article around our belief that vocabulary instruction should be ongoing. It should cut across grade levels and subject areas and be embedded before, during, and after the reading of texts and the introduction of concepts. We also emphasize the role of the teacher in implementing and facilitating each of the suggested strategies and, where appropriate, explain ways in which particular strategies can be adapted for use across different stages of a unit of study or reading lesson.

ACTIVATING PRIOR KNOWLEDGE AND INTEREST

Although it is possible for some students to learn vocabulary incidentally while reading texts (Shue, Anderson, & Zhang, 1995), students who struggle with reading usually need more explicit instruction to support their learning of new concepts, especially in content area classes. Activating readers' relevant prior knowledge before reading has been identified as an important first step in both raising readers' interest in a topic and improving their understanding of the concepts that will be presented in the reading (Heffernan, 2003; McKenna, 2004). Good teachers understand the importance of making content area materials relevant to readers (Ivey & Fisher, 2005). Activating students' prior knowledge with vocabulary terms can help them to make connections between their own experiences and subject area content (Guthrie & Wigfield, 2000). In some contexts, it makes sense to teach students how to analyze word parts before they engage with a text. At other times, explicit preteaching of whole words and concepts is a better approach. We suggest strategies for both situations.

TEACHING KEY MORPHEMES AND ROOT WORDS

Vocabulary instruction in content area classes presents a unique challenge. During the course of typical school day, students encounter new vocabulary in a variety of subjects, such as science, mathematics, health, art, and music. Many of the vocabulary concepts they encounter are low-frequency words that do not appear often to them in other contexts. At times, the same words may have different meanings in different subjects (e.g., chord in music and math have totally different meanings). Teaching students how to recognize and analyze word parts that may be familiar to them before they engage in reading a text can serve to make the vocabulary of content area texts more comprehensible. Morpheme analysis, in which students explicitly learn the meanings of morphemes commonly found in certain words, provides students with support for inferring meanings of unknown words (Baumann et al., 2002).
A morpheme is the smallest unit of a word that carries meaning. For example, \textit{alt} means \textit{high}, \textit{aqua} means \textit{water}, \textit{micro} means \textit{small}. Knowledge of morphemes and root words can help students learn unfamiliar words (Baumann et al., 2002; Mountain, 2005; Nagy & Anderson, 1984). Nearly 50 years ago, E. Thompson (1958) suggested that knowledge of just 14 root words and 20 prefixes would help students define more than 14,000 words in the dictionary. Cunningham (2000) reiterated the utility of using strategies that require students to acquire and apply knowledge of common morphemes. We are not suggesting that teachers focus their attention on the roots and prefixes identified by Thompson. However, we argue that within each subject area, there are root words and prefixes that students can learn that can, in turn, help them to better comprehend content area material.

For example, a middle school science teacher identified several of the morphemes commonly used in a textbook chapter she planned to have her students read for an upcoming lesson. Prior to assigning the reading, she took the time to present her students with the following morphemes and their common English equivalents that they would encounter in their reading:

\begin{itemize}
  \item \textit{agri} = field
  \item \textit{anti} = against
  \item \textit{aqua} = water
  \item \textit{bio} = life
  \item \textit{hydr} = water
  \item \textit{scop} = see
  \item \textit{terra} = land
\end{itemize}

Before reading their science text, students were asked to think of words that contained one of these morphemes. Students worked in small groups to brainstorm words they already knew. Their lists included words such as \textit{hydroplane, biology, stethoscope}, and \textit{agriculture}. At the end of the small-group session, the lists produced by each group were compiled into a class list. As the meanings of the words generated were discussed, students were better able to discern the meanings of each morpheme on the prereading list. As they began to read the assigned chapter, students were encouraged to pay particular attention to these morphemes in the context of their science unit.

Because the teacher took the time to activate students' background knowledge of these morphemes and to preteach concepts that would later be encountered in their reading of the text, students were better able to recognize the morphemes in context and attempted to decipher the meanings of content-related words that they may have otherwise skipped had the prereading experience not occurred. Common prefixes and suffixes, as well as both common and complex root words, can be pretaught in a similar manner (Cunningham, 2000).
Word knowledge is important across most subject areas, and no less so in fine arts. For example, the English word and root *tone* comes from the Latin word for tension and gives not only the word *tone* but also *monotone* and *intonation*. Other important music or sound root words come from Latin and Greek. *Phone* is the Greek word for sound from which English gets *cacophonous* and *microphone*, and from the Latin word *sonus* comes the root word *sound* in English with such terms as *resonates*, *sonnet*, *sonata*, and *sonorous*. From the Latin term *opus* (meaning *work*) come the words *opera* and *operate*. Content area teachers can provide students with instruction to develop their knowledge of subject-specific root words and prefixes so that students are better able to comprehend challenging texts in their classes.

**KNOWLEDGE RATING**

Teaching morpheme analysis provides students with access to a wide range of vocabulary, but not all words can be analyzed by students and broken into root words, prefixes, and suffixes. Another approach to preteaching vocabulary immerses students in word study—a mode of instruction that is both active and explicit. A Knowledge Rating (Vacca & Vacca, 2005) is one strategy that allows students to tap into their prior knowledge or schema. It also helps teachers and students assess both what students know and what they need to learn.

Vacca and Vacca (2005) suggested that teachers use the following steps when implementing a Knowledge Rating. First, develop a Knowledge Rating scale similar to that depicted in Figure 1; present students with vocabulary terms that they will encounter in their reading or in a unit of study. For example, in preparation for a science unit on volcanoes, a teacher presented students with the following vocabulary terms: *magma*, *lava*, *crater*, *vent*, *volcanologist*, *cinders*, *composite cones*, and *Aleutian Arc*.

Next, ask students to assess their understanding of these keywords by ranking each word on the Knowledge Rating scale, and discuss the words

<table>
<thead>
<tr>
<th></th>
<th>Don't know at all</th>
<th>Have seen or heard—don't know what it means</th>
<th>I think I know what it means</th>
<th>I know the meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>volcano</td>
<td>ger</td>
<td>vent</td>
<td>magma</td>
<td>lava</td>
</tr>
<tr>
<td>composite cones</td>
<td>cinders</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aleutian Arc</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
with students prior to their reading the text. It is important to encourage students to share what they know about the words and to elaborate on other contexts in which they may have seen or used these words. During this discussion, students can write the definitions of previously unknown words on their Knowledge Rating chart, which also serves as a way to establish a purpose for reading.

Finally, as students read the text, tell them to refer back to their initial Knowledge Rating when they encounter a new word. Encourage students to think about and use this strategy to help them understand information they read in the future. This allows the Knowledge Rating to be used in meaningful ways throughout a content area lesson—before, during, and after reading.

GRAPHIC ORGANIZERS

Graphic organizers come in many forms. They have long been a part of instructional activities that visually display new words while providing students the opportunity to compare and contrast these new words to already learned words. Use of graphic organizers can be a beneficial means of increasing students’ vocabulary knowledge. Strategies that include graphic organizers—such as concept wheels, semantic word maps, webbing, and semantic feature analyses, to name just a few—help support students’ learning of new vocabulary as well as teach the relationships among words (Nichols & Rupley, 2004). Graphic organizers are effective tools that incorporate many guidelines for the active processing of vocabulary.

Such vocabulary activities enable students to expand their vocabularies, understand relationships between a new word and existing concepts, and ultimately learn the meaning of the new word. When matched with the appropriate instructional design, these strategies can become part of prereading, reading, and post-reading activities. When used as a preteaching activity, these visual displays of words can activate and construct key concepts prior to reading. This can help motivate students to learn more about these concepts and set a purpose for the reading task while reinforcing the cohesiveness between vocabulary development and reading comprehension.

Graphic organizers are useful visual tools that support students in building both knowledge of concepts and an understanding of the relationship of these concepts to one another. Although graphic organizers can vary in format, their use can provide readers, particularly struggling readers, with the structure and organization necessary to make difficult and complex concepts more comprehensible (Guastello, Beasley, & Sinatra, 2000). Baxendell (2003) suggested the 3 C’s—consistency, coherency, and creativity—as guidelines for using graphic organizers effectively with struggling readers.
First, be consistent. Establishing a routine and predictable structure is often helpful to struggling readers. When applied to graphic organizers, the type of text structure can be established by familiarizing students with a standard set of general organizers and establishing routines for their use. Next, be coherent. Construct graphic organizers so that they illustrate clear links between concepts. Graphic organizers that are cluttered or unorganized can distract and confuse students rather than enhance their understanding of conceptual connections. A graphic organizer on the different branches of government (see Figure 2) offers a visually apparent and orderly depiction of connections related to the topic at hand. Finally, be creative. The use of graphic organizers should be adapted to meet the needs of the learners and the objectives of the lesson. Graphic organizers can be used during all stages of the reading process—before, during, and after reading. For example, their use can be incorporated into the completion of homework assignments as well as set aside for review or summary purposes. Use of graphic organizers can be implemented as a whole-group activity or reserved for small groups or pairs of students.

SUPPORTING AND EXTENDING VOCABULARY KNOWLEDGE

Research has consistently shown the importance of vocabulary to reading comprehension (Anderson & Freebody, 1981). But as our examples suggest, vocabulary is context and subject specific. It is the role of teachers across subject areas to extend and support vocabulary learning in ways that go beyond the traditions of using definitional approaches to more actively engage students in the process. Strategies such as semantic feature analysis, the Vocabulary Self-Awareness Chart, and vocabulary cards engage students in learning words in the context of their use.
Semantic Feature Analysis and KWL

Semantic feature analysis (Johnson & Pearson, 1978) can help students improve their vocabulary and categorization skills, understand relationships among words, relate their background knowledge to new words, and expand and retain content area vocabulary and concepts. Using a chart or grid, students are asked to analyze the similarities and differences among related concepts. Learning and understanding how the key concepts in text link to one another will help students' overall comprehension by moving them beyond memorizing definitions to comparing and contrasting how concepts interrelate.

To implement semantic feature analysis as an instructional tool, a topic is selected and words related to that topic are written down the side of the semantic feature analysis chart (see Figure 3). Features or properties associated with the words are listed across the top of the chart. Students are then asked to analyze each word according to the features or properties listed to determine whether each feature is associated with that word. If a feature is associated with the word, students indicate so by writing a Y (yes) or a plus sign (+) in the cell of the grid that corresponds to the word and feature being analyzed. If a feature is not associated with the word, the students write N (no) or a minus sign (-) in the corresponding cell. Students may write a question mark (?) if they are uncertain about the relationship of a particular feature to the word being analyzed. These questions can serve as a catalyst for further reading and study.

Figure 3 is an example of a semantic feature analysis on terms encountered in a seventh-grade North Carolina history text. The teacher selected key terms and phrases for the unit, including Louisiana Purchase, Missouri Compromise, the Kansas-Nebraska Act, and the Dred Scott Decision. A semantic feature analysis was designed to examine the words in more detail and their importance to issues such as slavery, politics, and region (North-South).

In order to analyze these similar words and concepts, it was helpful to combine the semantic feature analysis activity with another instructional strategy, the KWL chart (Ogle, 1986; see Figure 4). KWL is an acronym for What we Know, What we Want to know, and What we Learned." While students were in a whole-class setting, the teacher asked them to share everything they currently knew about events that had led up to the Civil War. Students recalled information about the Harper's Ferry raid and Lincoln's election and suggested slavery as a primary cause of the Civil War. As students shared what they already knew about events that had led up to the Civil War, they realized that the dates in which events had occurred would be useful to know, and they also expressed uncertainty about how the
FIGURE 3 Semantic feature analysis chart used in a social studies class.

Major events in the war had impacted the North and the South differently. Upon the completion of the K of the KWL chart, the students were guided to discuss features associated with different historical events. As the students suggested features, those features were written across the top of the board or chart, creating the matrix. As students broadened and defined their concepts in class discussions and readings, the teacher added words and features to the list and analyzed them, comparing and contrasting how what the students were learning linked to what they had already known before the lesson began. In order to facilitate comprehension of the text in which these words
What we Know | What we Want/Need to Learn | What we Learned
---|---|---
In the early 1900s, many families immigrated to the United States from Europe. Many of them were poor. Many came through a place called Ellis Island. | How many people came from Europe to the United States at that time? How did they get here? What were the traveling conditions like for those who were poor? | From 1880 through 1920, 23 million came to the United States. Those who were poor crossed the Atlantic Ocean on ships, usually as steerage passengers, in the lower level of the ship. Their traveling conditions were crowded. They slept in small bunks stacked three high. They ate food served out of large kettles.

FIGURE 4 KWL chart on the immigrant experience in the early 1900s.

occurred, the teacher guided the selection of the features that would be used to analyze the selected vocabulary, because this could have been difficult for students who did not yet fully understand the content.

Once the students finished discussing the features of the historical events, the teacher discussed the etymologies of the vocabulary words that the students would encounter as they attempted to complete the semantic feature analysis chart, as discussed earlier. After the completion of the K of the KWL chart, the discussion of the features, and the examination of the word origins, students attempted to complete the semantic feature analysis on their own. Because most of these words were still unfamiliar to the students and because the students might have been unsure of the features of the compromises, acts, decisions, and provisos early in the lesson, this only took a couple of minutes. Having each student attempt to complete the chart individually first established ownership of the activity and activated each student's individual knowledge about the words. It also motivated students to learn more in order to verify the information they put in the analysis chart, to see if they were right or wrong. The teacher then placed students in heterogeneous groups and asked them to reach a consensus and complete an analysis based upon what the group already knew about these historical events. Placement of students in heterogeneous groups provided peer scaffolding for struggling learners in the classroom as they interacted with more proficient peers.

After several minutes of group activity, the teacher pulled the whole class back together to complete the W of the KWL chart. (At this point the W may be changed from what students Want to know to what they Need
to know in order to more fully complete the semantic feature analysis chart; Nichols & Rupley, 2004.) As the students worked on the KW/NL chart, they determined what they needed to know about these historical events in order to differentiate between the compromises, acts, decisions, and provisos. All of the questions developed during the W of the KWL chart reflected the initial knowledge, whether correct or incorrect, that the students had brought to the initial analysis. These questions now became legitimate reasons for reading the text, thus setting a purpose for reading and facilitating comprehension of the text. At this point, students were ready to begin reading the history text and interacting with the materials provided by the teacher with a goal of accurately completing the semantic feature analysis and answering their questions on the KWL chart.

Upon completion of this reading activity, the teacher pulled all of the students back together as a whole class to have them discuss what they had learned about these historical events and to create a whole-class semantic feature analysis that represented the understanding of the class. This after-reading activity helped students make connections between what they had known (or thought they had known) about these events at the beginning of the vocabulary lesson and what they now knew about these events at the completion of the lesson, thus completing the L of the KWL chart.

In addition to being an effective strategy for learning content text, semantic feature analysis can be used with narrative reading materials to analyze character development over time, settings, plots, and so forth. It can also be effective when introducing new topics, reviewing previously learned topics, and integrating or comparing topics across different content areas (Rupley et al., 1999).

**Vocabulary Self-Awareness Chart**

The Vocabulary Self-Awareness Chart (Goodman, 2001) provides teachers with a way to provide explicit support for word and concept learning while involving students in the process of making choices about which words are important. Students write key terms in the "Word" column of the chart. Teachers can identify all terms or can provide key terms and allow students to select others they want to learn. Where possible, students write a definition in their own words and give an example. Students place a plus sign (+) beside terms for which they can provide both a definition and example, a checkmark (✓) beside terms for which they can provide either a definition or example (but not both), and a minus sign (−) beside terms for which they can provide neither.

The Vocabulary Self-Awareness Chart provides students with a tool for studying and learning new terms and allows students and teachers to assess vocabulary learning within a unit. Students can self-monitor and focus on terms for which they cannot give a definition or an example; teachers
can provide additional instruction and support for terms students in the class find challenging.

In a geometry unit, a teacher and her students identified the following as key terms: adjacent, bisect, congruent, line of symmetry, and vertex (see Figure 5). Students wrote these terms in the “Word” column and provided definitions and examples where possible. The teacher helped students clarify the definitions, and students worked in small groups to identify examples. The teacher realized that she would need to provide more instruction on such terms as line of symmetry, symmetry, and congruent.

The Vocabulary Self-Awareness Chart is a more active way to promote vocabulary learning and provides students with a tool for self-assessment. It also allows students a chance to work with definitions and examples in terms they more clearly understand.

Vocabulary Cards

Vocabulary cards are an outgrowth of flashcards, which have been associated with learning words for decades. There are many variations of this strategy, but most link terms and definitions with a visual association—a connection that Hopkins and Bean (1998–1999) found effective with diverse and low-achieving populations.

Students begin with a list of key vocabulary words found in a unit of study or text. Using index cards or similarly sized pieces of paper (5” x 8” work well, but smaller sizes will do), students divide cards into four equal

<table>
<thead>
<tr>
<th>Word</th>
<th>+</th>
<th>√</th>
<th>-</th>
<th>Example</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>adjacent</td>
<td></td>
<td>√</td>
<td>-</td>
<td>a bisected line</td>
<td>Close to something; side by side</td>
</tr>
<tr>
<td>bisect</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td>Separate into two congruent parts</td>
</tr>
<tr>
<td>congruent</td>
<td></td>
<td>√</td>
<td>-</td>
<td></td>
<td>Geometric figures with the same size &amp; shape</td>
</tr>
<tr>
<td>line of symmetry</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td>The point where two rays meet</td>
</tr>
<tr>
<td>vertex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Procedure:
1. Examine the list of words you have written in the first column.
2. Put a “√” next to each word you know well, and give an accurate example and definition of the word. Your definition and example must relate to what we are studying.
3. Put a “+” next to any words for which you cannot write only a definition or example, but not both.
4. Put a “−” next to words that are new to you.

This chart will be used throughout our unit. By the end of the unit you should have the entire chart completed.

Since you will be marking this chart, write in pencil.

FIGURE 5 Vocabulary self-awareness chart in a math class.
quadrants. Students can either fold or draw lines, but in either case have the students draw lines to separate the quadrants. On the front of the card, students label each section: "Term" in the upper left-hand corner, "Definition" in the lower left-hand corner, and "Picture" on the right-hand side. On the back of the card, students write "Relationship" in the upper left-hand corner.

Students fill out one card for each vocabulary term in the unit. It is best not to include too many terms, but students can also work on these in groups to streamline the process and provide an opportunity for cooperative learning.

For instance, a high school English teacher identified a list of 12 terms to go with a unit on *The Great Gatsby*. These terms were supercilious, fractiousness, infinitesimal, vacuous, florid, corpulent, vinous, rent, asunder, jaunty, punctilious, and laudable. She led a whole-class discussion of the 12 terms and provided students with index cards. Students worked in small groups, in which each student created a vocabulary card for each term. The whole-class and small-group discussions helped to activate students' prior knowledge and fill gaps in their background knowledge. Figure 6 is an example of a vocabulary card for the word *infinitesimal*. The teacher gave students five minutes at the beginning of the class period over the next few days to work in pairs to review these terms.

**CONCLUSION**

Each of these strategies—semantic feature analysis, the Vocabulary Self-Awareness Chart, and vocabulary cards—helps students learn words explicitly by connecting terms to more than a dictionary or glossary definition. Each requires students to draw on prior knowledge and connect new terms and concepts to verbal and visual examples, thus addressing the lack of in-depth instruction that has been the hallmark of traditional vocabulary instruction (Nagy, 1988). Each requires students to actively interact with concepts at a deeper level than reading a definition in a dictionary. In addition to the obvious advantage of helping students comprehend the textbook, teachers can teach these strategies to students with the purpose of giving
them tools to use independently if they are struggling in another subject. The ultimate goal will be to help students like Kaitlyn become motivated to learn and acquire the ability to use strategic thinking both in class and on their own.

REFERENCES


