

Supported Vocabulary Development from Context for Children Experiencing Reading Difficulties.

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The reading achievement gap is one of the most challenging and persistent problems that educators confront today. One vital area of concern is the learning of new vocabulary. It has been widely recognised that children with limited vocabularies find reading difficult, avoid reading, and learn fewer words in context. Many children with poor vocabularies will fall further behind their more able peers and develop more complex reading problems over time.

It has been widely recognised that there is a close relationship between the development of vocabulary and reading comprehension. A reader's ability to activate background knowledge to connect with information in working memory while decoding read text is crucial for the learning of new vocabulary. It would appear that students with comprehension difficulties are not deficient in general knowledge but they fail to use gap filling inferences and are not sure when and how to apply their prior knowledge to new word meanings in read text. The encoding of lexical elements requires children to attend to word forms as well as the semantic features in context. It includes contextual word-learning strategies and more intentional feature analysis. Visualisation strategies can help overcome working memory constraints and link more information to new word learning. When visual instructional techniques are applied in a multiple strategy reading program, such as KWL, they can improve children's vocabulary development and comprehension performance.

Effective vocabulary instruction takes place in a language rich environment that encourages word consciousness and active learning. It includes intentional teaching of new words in context with opportunities for word choice, repeated exposures, use and practice. Independence and active student engagement in learning is a characteristic of competent readers and an outcome of good instruction. Feedback is an important scaffolding technique but, to be effective, feedback needs to be specific and appropriate for the student's needs so that children can develop the ability to learn new words independently.

Introduction

Oral vocabulary is fundamental to a child's reading, academic development, and progress through school (Blachowicz, Fisher, Ogle, & Watts-Taffe, 2006; Ricketts, Nation, & Bishop, 2007). However, not all children entering formal schooling have the same level of oral vocabulary development. It has been estimated that the size of a child's receptive vocabulary at school entry can be somewhere between 5,000 to 10,000 words (Blachowicz et al., 2006). Children with poorer vocabularies may have up to 4,000 fewer words than children starting school from homes where parents interact and provide enriched language experiences (Apthorp, 2006; Biemiller, 2003). Children starting school with more than adequate vocabularies generally find reading easy, read more widely, and make better academic progress in school (Juel, 1988). As a consequence, such children tend to read longer and more varied texts and encounter new vocabulary as a result (Apthorp, 2006). Generally, good readers have a tendency to derive meanings for unknown words from the context as they read. As they encounter new words they are assimilated within the readers' existing knowledge structures allowing for further vocabulary growth (Neal & Kelly, 2002; Swanborn & de Glopper, 2002; Worthy, Patterson, Salas, Prater, & Turner, 2002). Conversely, children with limited vocabularies avoid reading and slip further behind. They generally find reading more difficult and learn fewer words in context. As a result, the gap between those who read more and have higher vocabularies increases in relation to their less skilled peers (Stanovich, 1986).

Quality of word representations

Perfetti (2007) maintained that vocabulary development is affected by the quality of children's word representations in memory and how efficiently they have been encoded. According to the *Simple View of Reading*, word reading ability and listening comprehension account for nearly all of the variance in reading comprehension (Gough & Tunmer, 1986). A number of researchers have also noted that word identification skills are much more dominant in

younger readers, whereas, the relationship between language comprehension and reading comprehension skills were more critical in older readers (Rickets, Nation, & Bishop, 2007; Vellutino, Tunmer, Jaccard, & Chen, 2007). Some readers, who experience difficulties, are more affected by the orthographic and phonological constituents of word representations. For example, phonological deficits are a major factor in the word reading ability problems faced by children with dyslexia (Stanovich, 1988). Such children, generally, have difficulty retrieving phonological representations of words and naming speed problems that affects ongoing reading performance (Wolf & Bowers, 2000). This combination makes reading less automatic resulting in more serious reading difficulties with accuracy and fluency. This difficulty may lead to further problems in retrieving background knowledge from long-term memory, which inhibits vocabulary acquisition (Reid Lyon, 2003; Savage, Lavers, & Pillay, 2005).

Other readers, experiencing difficulties, may be more affected by semantic and contextual qualities of word representations. For example, poor comprehenders have a particular difficulty using context to elicit semantic elements (Baylis, Jarrold, Baddeley, & Leigh, 2005; Snowling & Frith, 1986). Generally, poor comprehenders have good word decoding ability but have significant difficulty with both listening and reading comprehension. Exposure to high volumes of reading may not facilitate the acquisition of new vocabulary because such children do not focus on word meaning and have difficulty at incorporating general knowledge to fill in missing information necessary for learning new vocabulary (Cain & Oakhill, 1999; Leach, Scarborough, & Rescorla, 2003; Nation, Clarke, & Snowling, 2002). To compensate they often try and rely on their limited linguistic knowledge to fill in the decoding gaps as they read. However, there does come a time when such compensatory strategies can no longer adequately cope with the increasing complexity of the written language experienced beyond Year 4 (Fielding-Barnsley, Hay, & Asherman, 2005; Nation & Norbury, 2005). At this level the written language generally becomes much more complex and there is more emphasis on comprehension. In particular, the inability of these children to use inferential and contextual strategies to acquire meaning impedes their acquisition of new vocabulary and contributes to a widening gap between themselves and their more skilled peers (Bowyer-Crane & Snowling, 2005).

Capacity and inference

Generally, when children make inferences about information in read text it activates their own background knowledge and enhances the transformation of new information into the child's existing knowledge structures (Taylor, 1992). Skilled readers often do this automatically, and in so doing, are more likely to use relevant background knowledge to make sense of information implicit within the text. Such inferential processing is important for vocabulary acquisition as it enhances a child's understanding and memory for the new text information (Pearson & Johnson, 1978; Snow, 2002). In situations where children have either decoding difficulties or poor language based comprehension difficulties they tend to use automatic processes less and apply more conscious effort while reading. Normally, automatic processes free up working memory resources (LaBerg & Samuels, 1974), however, working memory has a limited capacity and processing efficiency is affected by the increased cognitive task loads (Achibald & Gathercole, 2007; Daneman & Carpenter, 1980; Just & Carpenter, 1992).

Less able readers also tend to include extraneous read text information, which further inhibits their ability to make appropriate inferences (Baylis, Jarrold, Baddeley, & Leigh, 2005; Kendeou & van den Broek, 2005; Swanson, Ashbaker, & Lee, 1996). The ability to inhibit irrelevant information and to efficiently allocate cognitive resources is linked to selective attention. Selective attention is goal directed and requires both the monitoring and encoding of incoming information for relevance to the reader's learning goals. Thus, the ability to make appropriate inferences is a crucial component in learning the meaning, encoding and storing new words (Blachowicz, Fisher, & Ogle, 2006). Yuill and Oakhill (1991) maintained that less able comprehenders generally have the capability of making inferences but need to be encouraged to use their inferential skills when reading.

Multiple strategy programs

In more recent times, there has been a greater interest in multiple strategy instruction and cooperative learning for students' comprehension development (National Reading Panel, 2000; Pressley, 2002; Snow, 2002). For example, Apthorp (2006) had positive results with third-grade children using a multi-strategy vocabulary intervention program that incorporated introducing vocabulary through rich literature, explicit vocabulary instruction, oral instruction, personalisation, active engagement, multiple reading opportunities with ample practice, and links to reading comprehension. Dole, Sloan, Trathen (1995) found similar results with high school students with vocabulary instruction by using a framework that included the declarative, procedural, and conditional dimensions of learning. A

study conducted by Lubliner and Smetana (2005) examined the effects of a multifaceted, metacognitive vocabulary intervention on the reading comprehension and vocabulary achievement of low-performing fifth-grade children. The intervention was designed to facilitate encoding of student-selected words, mastery of clarifying strategies, and executive control of strategies that maximise word-learning proficiency. Strong gains in vocabulary, reading comprehension, and increased metacognitive skills were documented following the 12-week multiple strategy vocabulary intervention.

Frameworks

One of the important benefits in using multiple strategy frameworks is that readers are able to use strategies routinely while they are reading (Szabo, 2006). For example, the KWL (Know-Want-Learn) strategy (Ogle, 1986) is a multiple strategy framework that develops children’s engagement and comprehension of read text. The framework develops students’ interest by helping them to brainstorm ideas and form inferences by activating background knowledge and setting learning goals. It also enables them to determine what they want to learn and to design their own questions. It provides the students with opportunities to elaborate on ideas and to monitor their understanding. Later, Szabo (2006) developed a variation of the KWL strategy to incorporate a more vocabulary focus known as the KWHHL (Know – Want - Head words - Heart words - Learn) strategy. The strategy was originally modified for year eight students because it was apparent that those students were having difficulty with content vocabulary. The first ‘H’ represented attention to head or hard words (new words) that the children encountered while reading. The second ‘H’ related to heart or feeling words that represented emotional content. In particular, the KWHHL framework was designed to activate comprehension and vocabulary strategies before, during and after reading (Table 1.) (Paris & Paris, 2003; Pressley, 1998).

Table 1
Comparison of the KWL and KWHHL frameworks

	KWL	KWHHL
Before	K - What I know W - What I want to know	K - What I know W - What I want to know
During		H - What are the hard words? H - What are the heart words?
After	L – What I learned	L – What I learned

Traditionally, the teaching of reading comprehension has relied mainly on verbal processes while visual imaginal processes have seldom been used in classrooms. While some students with learning problems experience difficulties in organising and recalling verbal information they may perform nonverbal tasks successfully and may benefit from mental imagery instruction (Kim, Vaughn, Wanzek, & Wei, 2004). It has been demonstrated that focused questions can activate students’ background knowledge by generating images, illustrations, analogies, metaphors, and summary sentences. Furthermore, Gambrell, Kapinus and Wilson (1987) argued that the activation of mental imagery also enhances comprehension by focusing attention, making inferences, organising and remembering text information by integrating information across text. It has been demonstrated that by having students discuss and generate visual images before, during, or after reading, vocabulary and comprehension outcomes improved (Block, 2004; Duke & Pearson, 2002; Pressley, 2002). The implication of this is that instruction programs need to consider the inclusion of memory enhancing strategies such as visualisation to facilitate children’s comprehension processing (Woolley & Hay, 2004).

Dual Coding Theory (Pavio, 1991) assumes that all cognition is composed of the activity of two mental codes: a verbal code that uses language and a non-verbal code that uses mental imagery to code objects and events (Sadoski, Goetz, & Rodriguez, 2000). This view is consistent with the Baddeley (2000) working memory model. The binding of verbal with mental imagery components in working memory has the potential to free up capacity restraints by utilising both visual and verbal systems to enhance the acquisition of vocabulary and reading comprehension (Block, 2004; Cole, 2003; Woolley & Hay, 2004). Sadoski et al. (2000) found that readers that engaged in the visual imagery strategy outperformed readers who did not receive the instruction. Sadoski and his colleagues argued that visualization freed up working memory capacity and helped readers focus their attention on developing the quality of their mental representations. Romeo (2002) demonstrated that the text comprehension of less able readers could be

enhanced by having trained tutors read aloud texts that were high in imagery related to text content. At relevant stages during the reading Romeo had the tutor stop and ask the child to visualise the story events and then share his/her images with the tutor. Romeo found that the children eventually imaged the text during reading, without prompting. Other researchers have also attested to the efficacy of using trained tutors to improve reading in general (Woolley & Hay, 2006). Furthermore, when visualisation strategies are modelled, practised and discussed within the context of a guided reading lesson, visual mental imagery promotes students' motivation to interact with and understand read text information (Block, 2004; Pavio, 1991; Pressley, 2002; Whitehead, 2002).

Semantic mapping for vocabulary learning is another visual approach that has been supported by research in a variety of classroom settings and can be included the KWL strategy framework (Table 2.). The research in this area suggests that having students make semantic connections among words, and verbalising or explaining those connections, enhances learning the meanings of the targeted words (Blachowicz, Fisher, & Ogle, 2006). Nesbit & Adesope, (2006) posited that concept maps have the benefit of lowering cognitive load and adding new cognitive associations to those already linked with previously encountered concepts. Furthermore, they reasoned that it enables a more efficient visual search than text passages and possibly a more efficient search of long-term memory. It was also suggested that the strategic placement of nodes on the map may reduce cognitive load and induce the deeper processing of meaning by minimising the visual or memory search required to distinguish or associate similar concepts. Boulware-Gooden, Carreker, Thornhill, and Joshi (2007) also had positive results when synonyms, antonyms, and other related words were included with the new vocabulary. Distinctive shapes and colours can also be used for nodes to represent different types of concepts. It should also be noted that the more connections an element has, the more often and faster it may be remembered (Rapp, van den Broek, McMaster, Kendeou, & Espin, 2007). When used in a collaborative group setting concept maps can enable children to articulate their ideas and can help to elaborate on meaning through discussion (van Boxtel, van der Linden, Roelofs, & Erkens, 2002).

Table 3
Comparison of the KWL, KWHHL, KWOL, Self-regulation (Zimmerman, 2000) frameworks

	KWL	KWHHL	KWOL (A developing framework – Woolley)
Before	K W	KW	K – (inclusion of visualisation strategies such as menal imagery and semantic mapping) W
During		HH	O – Orientation (discussing, clarifying, elaboration, inclusion of visualisation strategies such as menal imagery and semantic mapping)
After	L	L	L – (inclusion of visualisation strategies such as menal imagery and semantic mapping)

Flexibility, word awareness and metacognition

What is needed is an intervention framework that will enable flexible procedures to be put into place. Such a framework should provide a cohesive structure but also provide enough flexibility to enable children to set reading goals, monitor their own progress by making informed choices, and to reflect on the adequacy of their learning (see Table 3.) (Zimmerman, 2002). However, unskilled readers tend not to set adequate learning goals, monitor their own understanding and do not know how or when to use fix-up strategies to regain meaning when it is lost (Savage et al., 2007; Zimmerman, 2002).

It has been shown that children can be more cognitively engaged when they are taught to use metacognitive skills such as asking themselves appropriate questions and monitoring their own responses for understanding (Guthrie Wigfield, Barbosa, Perencevich, et al., 2004). The use of metacognitive strategies, such as these, can help students to “think about their thinking” before, during, and after they read (Boulware-Gooden, Carreker, Thornhill, & Joshi, 2007). One way to foster this type of learning engagement is to encourage students to compose and answer their own questions to clarify understandings and develop deeper meaning through a more elaborative discussion (Palincsar & Brown, 1984).

There is extensive research that confirms the effectiveness of teaching children to monitor meaning and to implement cognitive strategies as a means of improving reading comprehension (Lubliner & Smetana, 2005). In particular, the active monitoring of word understanding is an essential metacognitive step in the construction of meaning (Guthrie et al. 2004; Linnenbrink & Pintrich, 2003; Lubliner & Smetana, 2005). Teaching children to apply metacognitive skills to vocabulary acquisition is likely to strengthen both vocabulary development and reading comprehension (Blacowicz, et al., 2006). Blachowicz, Fisher, and Ogle (2006) maintained that learners should be encouraged to be actively involved in the generation of word meanings rather than as passive receptors of information. Such active student engagement in learning is a feature of good instruction and a characteristic of skilled readers. In addition to providing multiple sources of information, repeated exposure is an important component of word learning because it provides more opportunities for practice. Furthermore, the researchers observed that when students were allowed to choose their own words for vocabulary and spelling instruction, they were able to develop more effective and longer-lasting word learning.

Table 3
Comparison of the KWL, KWHHL and KWOL frameworks

	KWL	KWHHL	KWOL	Self-regulation (Zimmerman, 2002)
Before	K W	KW	KW	Goal setting
During		HH	O - Orientation	Monitoring and selecting
After	L	L	L	Reflection on meaning

Words in context

There is evidence to suggest that effective instruction can make a difference in achievement for students, including those most at-risk (McDonald Connor, Morris, & Underwood, 2007; Pressley, 2002). Furthermore, there is general agreement that children with reading difficulties need systematic, direct instruction, particularly when coupled with explicit strategy instruction (Alfassi, 2004; Vellutino et al., 2004; Woolley, 2007). The more explicit the strategy and self-regulatory instruction, the higher the likelihood that they will make significant gains in reading comprehension (Manset-Williamson & Nelson, 2005). The danger is that children may become too reliant on direct instruction and scaffolding. Therefore, it is important that teacher support is gradually reduced as the children gain more confidence and control of their vocabulary learning (Duke & Pearson, 2002). What is needed is for children to be shown how and when to use word learning strategies in flexible ways in a variety of settings (Cartwright, 2006; Gersten, Fuchs, Williams, & Baker, 2001). Hence, the progression from teacher direction to student self-regulation is essential for the development of reading engagement and deeper word learning (Gambrell et al., 1987; Woolley, 2006). Critical elements of the reading instruction program for learners at risk involve systematic and structured vocabulary instruction, opportunities to read and to experience frequent success, adequate feedback, practice, and frequent monitoring (Pressley, 2002; Snow, 2000).

The role of focused dialogue in activating background knowledge and developing mental visual imagery should be considered as a method to enhance inference making (Gambrell, Kapinus & Wilson, 1987; Pressley, 2002). Teachers can use focused dialogue to create a learning environment in which students develop self-regulation and error detection skills (Hattie & Timperly, 2008). Feedback can be provided through dialogue to give specific information that fills the gap between what is understood and what is to be known (Hattie & Timperly, 2008; Shute, 2008). Feedback can assist less able readers because they are not always aware of the knowledge base they bring to the reading situation and may need appropriate feedback to help focus their attention (Pearson & Johnson, 1978). Such feedback should be non-evaluative, supportive, timely, and very specific (Shute, 2008). Specific feedback can encourage students to take ownership of the strategies they use and to help them set new goals. To be effective, feedback should focus on the learning process rather than on the learning task product (Bandura, 1999; Coleman & Bornholt, 2003; Hareli & Weiner, 2002). What is certain is that learners are more likely to seek and receive feedback when they share a commitment to attaining a shared learning goal (Hattie & Timperly, 2008).

Summary

Children with limited vocabularies generally find reading difficult, avoid reading, and learn fewer words in context. Effective vocabulary instruction should provide both definitional and contextual information about the meaning of new words. Vocabulary development in children with reading difficulties is affected by the quality of word representations and how efficiently they are processed in working memory. Working memory efficiency can be enhanced using both verbal and visual strategies. It should take place in an environment that encourages interest in words. It should include deliberate teaching of selected words, providing various types of information about each new word as well as repeated exposure, use, and practice. It should also involve teaching children active word-learning strategies in ways that give students the capacity to learn new words without assistance and offers multiple exposures to meaningful information about words and related words. Involving students in multiple strategy programs that utilise discussions before, during, and after reading or listening to a book has been found to enhance vocabulary development, especially when teachers scaffold learning by using visual mapping strategies, asking strategic questions, and elaborating meanings through focused dialogue. For vocabulary and comprehension improvement to effectively take place, children with reading difficulties need to develop metacognitive strategies to monitor and regulate their own learning. Appropriate process feedback can encourage students to more effectively engage with learning and develop self-regulation strategies.

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