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ABSTRACT

This paper reviews nine principles regarding the reading process, and six scaffolds for teaching students to read, and then suggests a specific developmental reading program for a learning center built upon this knowledge. It is generally accepted that four factors interact to form the reading/learning process: (1) Material; (2) Self; (3) Strategy; and (4) Task. These four factors are depicted in a tetrahedral model, with "self" at the apex. In Schema theory, the effect of a reader's background knowledge on reading comprehension is considered. Limited background knowledge can manifest in limited word recognition, limited vocabulary development, affective issues, and response to material factors of the text. The author argues that reading in a study situation is as much a strategic process as it is a comprehending process. Research indicates that successful readers have metacognition of the elements of the reading process, while unsuccessful readers do not. Mapping, note taking, and summarizing are effective ways of helping students develop metacognitive ability. This paper delineates the following scaffolds for use in a learning assistance center: (1) Assessment Scaffold; (2) Metacognitive Scaffold; (3) Instructional Scaffold; (4) Strategy Scaffold; (5) Writing Scaffold; and (6) Technology Scaffold. (Contains 4 figures and 105 references.) (NB)

Teaching Reading in a Learning Assistance Center

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Teaching Reading in a Learning Assistance Center

David Caverly, Southwest Texas State University

Joe comes to your Learning Center with this piece of text he cannot understand (see Figure 1). What would you do to help him read it? More importantly, what would you do to help Joe learn how to transfer what you teach him to succeed in any piece of text? The answer to these questions is simple: teach him how to read. Easy to say, but hard to implement. To be an effective teacher of reading, you have to consider everything you know about the reading process and the teaching of reading, then orchestrate it into a developmental reading program. In this paper, I will review nine principles we in the field have learned in the last half century about the reading process and six scaffolds on the teaching students to read, and then suggest a specific developmental reading program for a learning center built upon this knowledge. This should help the Joes of our world.

Clostridium Septicum (Vibrion Septique)

Clostridium septicum is a grampositive, motile, sporulating, strictly anaerobicrod, the cells of which have somewhat pointed ends. Capsules are not formed. Spores are located subterminally or centrally and are formed readily in culture media free of fermentable carbohydrate and rarely in the animal body. The cells are arranged typically in long chains within the body butoccur singly or in chains and groups in culture. Colonies have arborescent or rhizoid margins with deep opaque centers.

Clostridium septicum ferments carbohydrates with production of abundant gas, is moderately proteolyticin that it produces H2S and liquifies gelatin, but does not produce indole or digest coagulated proteins. Cultures may be divided into immunologic groups on the basis of cellular and lagellar agglutinogens. Cross reactions occur with CL, Chauvoei, and animal pathogen, the cause of black leg in cattle and horses. Colstridium septicum has been recovered not only from human gas gangrene but also from gasgrenous and highly fatal infectionsin domestic animals. In laboratory animals, subcutaneous innoculations are followed by development of an edematous, destructive local lesion and by septicemia which is usually rapidly fatal. Pathogenicity is related to production of specific toxin, which in relatively large doses is highly lethal. Locally the toxin produces a marked edema and nacrosis. Specific neutralizing antitoxin which has therapeutic value has been produced.

Figure 1: Sample college text (author unknown)

What Have We Learned about the Reading Process and Teaching It?

Many students enter higher education under-prepared for the reading demands that are placed upon them. When pressed to read, they often select ineffective and inefficient strategies with little strategic intent (Caverly & Orlando,1991b; Wade, Trathen & Schraw, 1990). Often, this is due to their level of reading strategy knowledge and lack of metacognitive control. Another reason might be their inexperience coming from the limited task demands of high school and lower division college coursework (Chase, Gibson &Carson, 1994; Orlando, Caverly, Swetman & Flippo, 1989; Wade et al.,1990). To help these students, we as college reading teachers often teach specific reading techniques. Research over the last several decades suggests instead we should be teaching our developmental students a strategic approach to study-reading informed by those principles we have learned about reading and learning.

Regardless of your philosophical perspective to how students learn, it is generally accepted that four general factors interact to form the reading/learning process. These factors can be depicted (see Figure 2) as a tetrahedral model (Brown, 1980; Caverly & Orlando, 1991b; Jenkins, 1979; Nist, 1985):

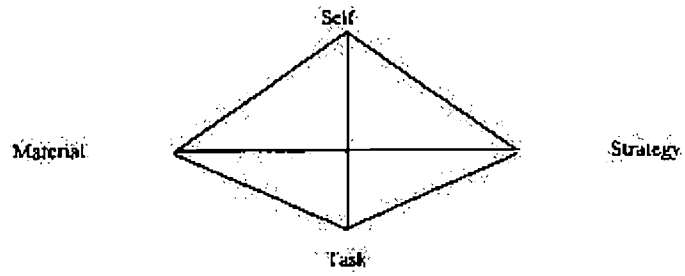

Figure 2. Tetrahedral model of learning

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Self Factors

At the apex of this tetrahedron are factors related to "self," the contribution made by the readers background knowledge, attitude, interests, and motivation on their ability to understand any piece of text. Unless readers contribute these factors proactively, understanding can fail.

Schema Theory

The effect of a reader's background knowledge on reading comprehension is typically labeled Schema theory (Anderson & Pearson, 1984). This theory argues what you know affects what you understand. For example, consider how you as a competent reader are able to understand this text:

> If the balloons popped, the sound would not be able to carry since everything would be too far away from the correct floor. A closed window would also prevent the sound from carrying since most buildings tend to be well insulated. Since the whole operation depends on a steady flow of electricity, a break in the middle of the wire would also cause problems. Of course the fellow could shout, but the

> human voice is not loud enough to carry that far. An additional problem is that a string could break on the instrument. Then, there could be no accompaniment to the message. It is clear that the best situation would involve less distance. Then, there would be fewer potential problems. With face to face contact, the least number of things could go wrong.
>
> Figure 3: Sample Text. (Bransford & Johnson, 1972)

I suspect if you are like most readers seeing this for the first time, there are few if any words you do not recognize in this text. Still, you are unable to understand. Much of your confusion comes from your inability to access an appropriate base of knowledge-that is, the correct schemata. Without engaging those specific knowledge bases (recalling them from your long-term memory), comprehension clunks along and, for some readers, fails altogether.

However, once you recognize the focus of this passage as being about an electronic Romeo, then you can recall what you know about Romeo and Juliet from Shakespeare's play, what you have seen in movies and books about Lotharios strumming guitars under a lover's window, what you know about electronic guitars with attached wires, what you know about helium filled balloons, and what you know about five-story

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buildings. Orchestrating all of these separate bases of knowledge, and using a picture as a schemata activation point (see Figure 4) you should now be able to understand the text.

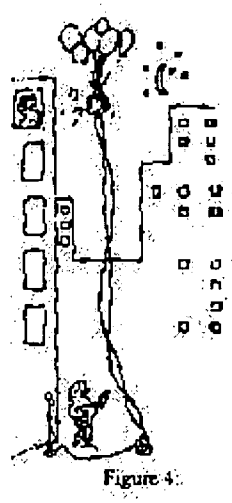

Figure 4:

Figure 4:

Understanding now occurs because you as a reader are able to engage your schemata (Anderson & Pearson, 1984). If the author does not provide enough semantic cues to activate your schemata and/or the teacher is not available to do so, you must take on the responsibility of engaging your own schemata. Therefore, one of the reading techniques we must teach Joe is how to engage his schemata (Mulcahy, 1987). Some useful instructional strategies for teaching students how to activate their schemata have emerged through procedures like Reciprocal Teaching and Cognitive Apprenticeship training (Shuell, 1996) to be discussed later in this paper.

Word Recognition

The effect of limited background knowledge on understanding often manifests itself for the reader in ineffective word recognition abilities and/or weak vocabulary knowledge. Naively, developmental students assume that if they could pronounce all the words (decoding) or if they only knew all the words (vocabulary density), understanding would come. Many students vainly attempt to learn words by writing them, a definition and three sentences on 3x5 cards. Or, they practice word recognition tactics like context clues, affix or phonemic analysis, or dictionary skills in an attempt to improve their ability to recognize new words. The result often is college developmental students who can say all the words, but comprehend little. For example, look at the text in Figure 1. As competent readers, you and I can probably say each word, but typically can not understand most of the words, let alone

comprehend the text. Thus, recognition includes more than an oral translation.

A second principle we have learned is that word recognition is necessary but not sufficient to effective reading. If you accept comprehension as the goal of reading, word recognition is the foundation of reading proficiency (Daneman, 1991; Stanovich, 1991).Of those word recognition tactics available to readers (context clues, affix analysis, phonemic analysis not phonic analysis, and dictionary access), phonological recoding via phonemic awareness seems to be the most important at the beginning stages of learning how to read (Stanovich, 1991). Later, ability to use context clues, affixes, and dictionaries become more effective strategies in recognizing words and certainly in learning new words. Therefore, perfect automaticity in word recognition seems less important at the state when we see most readers than strategic flexibility in word recognition tactics. If readers run across an unknown word, he or she decides is important to understanding the text (based on its frequency

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and placement in the text),then context clues seems to be the first strategy of choice. If , however, there are not enough context clues to aid in recognition, then examination by affixes, phonemics, and/or a dictionary (note, in that order) can best lead to understanding the word. However, the focus on the word in these latter three tactics often cause a reader to "win the battle but lose the war." Because of the inordinate amount of time needed in these latter three tactics to understand the word, they can interfere with the whole passage understanding. Thus, word importance (an answer only available through context clues) must take precedence before affixes, phonemics, and/or dictionary word recognition strategies are applied. Therefore, we need to teach Joe strategic flexibility in word recognition. However, teaching students like Joe to use context clues does not necessarily help them learn new words(Simpson & Dwyer, 1991).

A strategic approach to word recognition fosters efficiency in reading. A strategic reader would first determine the importance of the word to the text. If it were deemed important, then this reader would use context clues to make an educated guess. If insufficient clues are

available, then this strategic reader would look for a little word within the bigger word using affix analysis. If this was ineffective, then finally this reader might look it up. Moreover, if the word is deemed important beyond the current task demand, this strategic reader would use vocabulary development strategies. Word recognition must only be considered as a means to the end of vocabulary development and comprehension of print.

Vocabulary Development

A third principle we have learned from the research over the last half century is the connection of vocabulary knowledge to successful reading. We can draw three main conclusions about vocabulary knowledge and successful reading performance (Ruddell, 1994;Simpson & Dwyer, 1991): (a) there is a strong positive correlation between vocabulary knowledge and comprehension (however, this might be more a measure of integrated schemata in the form of background knowledge, rather than isolated vocabulary recognition); (b) there is an equivocal relationship between teaching vocabulary and improving comprehension (that is, sometimes teaching vocabulary improves comprehension, while sometimes it does not);and (c) there are several variables interfering with this relationship (e.g., what it means to know a word, how we measure vocabulary, how we teach vocabulary, how many words do we know, or how we learn vocabulary). For example, it is estimated that we come to school at age 5 with about 5,000 words in our listening vocabularies and we leave college with about 50,000 in our listening and reading vocabularies (Just & Carpenter, 1987). This means the average reader learns 2,700 to 3000 words a year, or 7 to 8 words a day. Obviously, most readers do not memorize word meanings on 3x5 cards every day for 16 years. Rather, proponents of vocabulary development (Simpson & Dwyer,1991; Stahl, 1986) argue we follow four tenets as we learn new words. First, we learn both a definitional and a contextual understanding of words. That is, we form a link within one schema for a word and then decontextualize that word by forming links to other schemata. This decontextualization occurs through extended experiences with the word in a variety of contexts.

Second, students must be active processors of words learning the fine distinctions separating the word used in various contexts. Instructional strategies such as Concept of Definition maps (Schwartz & Raphael,

1985), Semantic Feature Analysis (Anders & Box, 1986), and association through graphic organizers particularly when created by students (Carr & Mazur-Stewart, 1988) are very effective at helping students learn to be active processors.

Third, learning a word comes often from multiple exposure over time. Good readers have good vocabularies because they see words in a variety of contexts innumerable times. This is particularly true when they read authentic text which provides a rich context of recognizable words, image-evoking cues, and even incidental learning from just one exposure to words (Nagy, Herman & Anderson, 1987; Ruddell, 1994). Poor developmental college readersas well can learn from this authentic, meaningful contexts (Schwanenflugel & Stowe, 1989).

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Fourth, motivation for learning words is developed through students self-selecting words to learn and social discussions about new words. Using a strategy called a Vocabulary Self-Collection Strategy, Stewart (Stewart, 1992) found a sense of ownership and pride in learning vocabulary.

So, we have to teach Joe how to develop his vocabulary. However, vocabulary development theory (Pauk, 1984; Tonjes, 1991) suggests that we have three different vocabularies (see Figure 5): an expressive vocabulary (those words we use in our speaking and writing), a receptive vocabulary (those words we use in our listening and reading), and a frontier vocabulary (those words we don't know).

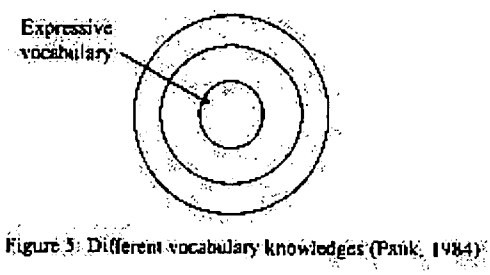

Figure 5: Different vocabulary knowledges (Pauk, 1984)

Figure 5: Different vocabulary knowledges (Pauk, 1984)

It is general consensus that vocabulary development takes place over

time as new concepts move from frontier to receptive to expressive. Instructionally for Joe, we need to form a link in our schema for new words and then provide an opportunity to reinforce that link through meaningful practice where the word is decontextualized from a specific example in a particular text to broader applications in a variety of texts. Successful instructional strategies have emerged for facilitating this movement including concept of definition maps, semantic feature analysis, and structured overviews(Ruddell, 1994; Simpson, Nist & Kirby, 1987).

Affective

A fourth principle we have learned about reading development is the importance of students' interest in, motivation for, and attitude toward reading. Recent research has documented that many college developmental readers have a history of failure, but there are some suggestions that negative interests, motivations, and attitudes can be overcome (Hirsch, 1994; Stallworth-Clark, Scott & Nist, 1996;Stevenson, Stanfill, Burleson, Cyrus & McCarthy, 1996). Currently a substantial effort is underway in the research community exploring the affective issues surrounding reading (Baumann, Allen & Shockley, 1996). In the near future, we hope to know much more about a student's decision to read.

Material Factors

A second vertex on this tetrahedron considers material factors, that is, the contributions made by the text which affect readers' understanding. A fifth principle we have learned over the last half century is that reading must be adapted for different types of material. Pragmatically, there are two major types of text: expository and narrative (Pearson & Fielding, 1991). Within expository text, information is presented, usually to inform. Within narrative text, a story is being told, usually to entertain. We have learned that both texts have a microstructure and a macrostructure which organize information at the sentence level and paragraph level respectively (Nist & Meeley, 1991). Little research has been done on the effect of microstructure on college students' understanding, so we will focus on the macrostructure.

Narrative Text Material

We have learned that narrative text material has a specific structure representing how the story is told. Typically called a story grammar (Thorndyke, 1977),a simple story consists of several elements: a setting, problem, goal, action, and outcome. Research (Kintsch, Mandel & Kozminsky, 1977; Stein & Nezworski, 1978) has demonstrated that well-formed stories (with explicit story grammar elements) are more easily

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understood than ill-formed stories (implicit or missing story grammar elements), particularly among developmental readers. Moreover, teaching developmental students to recognize the story grammar or organization of narratives generally improves their comprehension (Idol, 1987; Nolte & Singer, 1985; Singer & Donlan, 1982).

Expository Text Material

Within expository text material, two major factors are present which potentially affect a reader's understanding: ordination and relationships. Most of expository prose is organized hierarchically (i.e., topics, main ideas, and details)into super-ordinate, co-ordinate, and sub-ordinate ideas (Meyer, 1975).Explicitly organized text, called "considerate" text, is easier to understand than "inconsiderate" text (Armbruster & Anderson,1984; Colwell & Heldfelt, 1983; Kieras, 1985; Schumm, Ross & Walker,1992). In many textbooks super-ordinate main ideas are explicitly stated less than 60% of the time (Armbruster & Anderson, 1984; Chase et al.,1994). A major weakness in developmental readers is their inability to find main ideas when they are explicit or to infer them when they are implicit(Englert & Palincsar, 1991; Meyer, Brandt & Bluth, 1980; Wade et al., 1990). Much of teaching developmental students to understand expository text material is teaching them how to recognize and infer the main ideas (Johnson & Afflerbach, 1985). Some have argued (Kameenui, 1986) and successfully demonstrated (Brown & Day, 1983; Day, 1980) that this ability is actually a summarization tactic. Teaching summarization consists of helping students learn a five-step process of: (1) deleting trivial information;(2) deleting redundant information; (3) providing a super-ordinate term for members of a category; (4) identifying any main ideas that serve as the super-ordinate term; and (5) creating your own super-ordinate term if the author does not. Some have had success teaching students to recognize main ideas using direct instruction (Baumann, 1984;

Casazza, 1993), teaching students the metacognitive strategic value of a given technique (Holley& Dansereau, 1984; Schunk & Rice, 1987), or using text headings(Grant, 1993).

A second factor of expository text that affects developmental students comprehension are the relationships between the ideas. Meyer (1975) identified five general patterns of text structure present in expository material (collection or categorization, comparison/contrast, cause/effect, description, and problem/solution). Developmental readers who are unable to recognize these structures perform poorly on comprehension measures (Bartel, 1993/1994; O'Hear, 1991). When the author makes these patterns explicit through the use of signal or transition words (Dee-Lucas & Larkin, 1990) or the teacher provides maps (Dansereau, 1980), comprehension improves significantly. Still, authors and teachers are not always helpful.

Much like ordination, students can be taught to recognize structural patterns through the use of maps of varying shapes. For example, students can be taught to use hierarchical or tree diagrams for depicting categorization patterns or description patterns, charts for comparison/contrast patterns, herringbone diagrams for cause/effect patterns, and flow charts for problem/solution patterns. This can directly improve their comprehension (Pearson & Fielding,1991).

Strategy Factors

Strategies versus Tactics

A sixth principle we have learned is that reading in a study situation is as much a strategic process as it is a comprehending process. That is, informational reading (i.e., study-reading)is different from entertainment reading or persuasive reading. Several theorists have helped us understand study-reading by differentiating between study tactics and study strategies (Derry & Murphy, 1986; Paris, Wasik &Turner, 1991). A study tactic is usually defined as a study-reading technique used without purpose or without monitoring (e.g., underlining or highlighting without review). A strategy, on the other hand, is reading in a systematic, planned manner. For example, before reading identifying the purpose for reading and selecting an appropriate

study-reading tactic to attain that purpose; during reading systematically applying the tactic, and monitoring its

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effectiveness; and after reading recursively selecting another tactic or set of tactics if unsuccessful, as well as reviewing and reflecting on the purpose if successful (Paris, Cross & Lipson, 1984). A study-reading strategy, therefore, is an methodical, premeditated, evaluative approach to a task and material demand within the constraints of self-awareness of strengths in background knowledge, attitude, interest, and motivation. That is, it is an interaction of the four vertices of the tetrahedral model (Caverly & Orlando, 1991b).

Literally hundreds of empirical studies have examined the effectiveness of individual study-reading tactics or collections of tactics performed together. We can conclude from this research that study-reading tactics are for the most part equivocal in their effectiveness in improving reading comprehension, remembering, and transfer to reading beyond the experiment to the college classroom (Anderson & Armbruster, 1984; Caverly & Orlando, 1991b). The lack of a positive effect for a given tactic might be due to the fact that it is typically taught in isolation away from authentic text and often applied unstrategically (Derry & Murphy, 1986; Harris & Pressley, 1991). Therefore, a more productive approach would be to teach tactics as part of an overall strategy. (Paris et al., 1991).

Metacognition

A seventh principle is the importance of metacognition in any strategic approach. Metacognition consists of students' declarative knowledge about the elements of the reading process and cognition, or how well students understand their role in the reading act; procedural knowledge about self-regulation as students monitor the reading act moving toward a particular goal; and conditional knowledge or control over when and where to apply specific strategies (Baker & Brown, 1984; Nist & Meeley, 1991; Paris et al., 1991). In many ways, it is the developmental students ability to manipulate and monitor the two-way, three-way, and four-way interactions between the four vertices in the tetrahedral model depicted in Figure 2 above (Caverly & Orlando, 1991b). Research has demonstrated that successful college readers have metacognitive abilities while unsuccessful readers do not (Wade et al.,

1990).

Awareness, knowledge, and control of their role in the reading process seems to be necessary for developmental students' successful reading comprehension. Wade and Reynolds found three types of awareness are necessary and can be taught: task awareness (aware of the purpose for reading); strategy awareness (aware of what strategies are available for accomplishing this purpose); and performance awareness (aware of how effective each of these strategies is for accomplishing the purpose).

Specific strategic reading behaviors can help develop metacognitive knowledge. Mapping, notemaking, and summarizing are effective in helping students develop metacognitive abilities (Paris et al., 1991). Still, teaching just metacognitive strategies and not their connection to cognitive strategies does not seem to improve reading comprehension (Garner, 1994; O'Neill, 1992; O'Neill & Todaro, 1991). Moreover, a sense of competence and control seems to be necessary for developmental students to create a sense of self-efficacy and have success with metacognitive and cognitive strategies (Nist & Simpson, 1994; Paris et al., 1991).

Task factors

An eighth principle we have learned is that task factors also affect understanding. In some contexts, research has found little if any need to read (Orlando et al., 1989) as professors in lower division classes restate what was present in the text. More recentresearch has found task demands have increased with professors expecting more and more (Chase et al., 1994) or extremely complex task demands within upper division classes (Caverly & Orlando, 1991a). Also, higher levels of academic literacy (Pugh & Pawan, 1991) within ill-structured domains of knowledge as might be experienced in graduate or professional schools(Spiro, Coulson, Feltovich & Anderson, 1988) require even different cognitive and metacognitive abilities. It seems no one reading strategy can be applied to all task demands, suggesting that flexibility and competence in a variety of reading strategies is warranted (Caverly & Orlando,1991b).

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An Instructional Plan for Teaching Reading in a Learning Assistance Center

What might you teach Joe that is informed by this research to help him succeed in this piece of text ? A useful analogy is to use scaffolds in your learning assistance center that can provide support for Joe as a developing reader until he is able to succeed on his own. This support appears in the form of six scaffolds:

Assessment Scaffold

At the outset, use a scaffold of authentic assessment to evaluate Joe's ability to read. Any screening or diagnostic instrument you select should evaluate his ability to (a) engage his prior knowledge; (b) strategically recognize words in authentic contexts; (c) explain tactics for developing vocabulary; (d) justify attitudes, interests, and motivations for reading;(e) explain how to strategically approach a wide range of texts; (f) recognize and use story grammars in narrative material as well as ordination and relationships in expository material for comprehension and retention; (g) self-regulate the reading act in terms of declarative, procedural, and conditional knowledge; and (h) identify and defend a variety of reading strategies. If you don't find a test that authentically assesses all of this, then locally develop your own (Caverly & Nicholson, 1993). You might duplicate a chapter from a typical freshmen level textbook and ask Joe to take it home to study. When he returns, give him an objective/subjective test as might be found in the teacher's guide. Score and discuss with him his success. Typically Joe will do poorly. This leads to the second scaffold.

Metacognitive Scaffold

A second scaffold builds from Joe's understanding of his role in the reading process and his ability to read. We have found most developmental students are naive regarding their role in the process assuming an external locus of control (Stevenson et al., 1996; Swan, Mitrani, Guerrero, Cheung &Schoener, 1990). Therefore, we build from a foundation of Joe's understanding of whatever strategies he is currently using. However, we place these strategies in question by testing the viability of these strategies against the task demands placed upon them by higher education. We ask Joe to assess his performance on the assessment measure using the strategies he used. Next, we discuss what other options might be available using what we call a demand model (Caverly & Orlando, 1991b). That is, research has deemed certain study-reading strategies more efficient but less effective

(e.g., reading once, re-reading, or underlining/highlighting), others more effective but less efficient (e.g., outlining, mapping, PLAN), while still others are somewhere in the middle of this effectiveness/efficiency (e.g., notemaking, summarizing, generative questioning). Then, we demonstrate his internal strengths in terms the role of his prior knowledge (i.e., schema theory) in understanding, the role of metacognition in the monitoring of that understanding, and the need to expand his reading strategy repertoire. Third, we discuss the role of the author and the support he/she provides via the rhetorical structures used in their prose. That is, we introduce the third scaffold; a sound instructional regimen.

Instructional Scaffold

To proactively improve Joe's reading ability, we begin an instructional regimen. Joe can be taught directly how to self-regulate or take control over his strategic approach to reading (Baumann, 1984; Casazza, 1993; Grant,1993; Hock, Schumaker & Deshler, 1995; Paris et al., 1991; Winograd & Hare, 1988). He also can be taught strategic reading indirectly using Reciprocal Teaching (Palinscar & Brown, 1984) or a Cognitive Apprenticeship model (Collins, Brown & Newman, 1989; Shuell, 1996). I favor these latter two instructional regimens as developmental students are taught to make their "thought processes visible" thus helping them metacognitively understand what strategies they are selecting, evaluate the effectiveness of such a choice, and monitor its effectiveness. Beginning with modeling, the teacher takes on most of the cognitive load of a strategy he/she is demonstrating. Together with think-alouds, the teacher (this can be you/atutor/or instructional media) should demonstrate a given strategy and the thought processes required to orchestrate the interactions between considering what oneself brings to the reading act, the quality of the material, which tactic to select, and how effective one's performance is toward the task. Joe during this modeling stage is not overtly active, but is led to see the "big picture" which helps him recognize the purpose of the strategy.

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During this **modeling** stage, the teacher considers his/her strategies for reading and creates a tactic to model for Joe. Strategies are internal, covert conceptions of external, overt tactics. The teacher must infer what he/she does when applying a strategy and create a tactic to demonstrate it. For example, one tactic I might use to identify text relationships inexpository prose is to look for signal words. I have

taken an internal strategy and converted it to an external tactic that I can model to students like Joe. Note, I also have to model how I knew the material was expository, my motivation, interest, and attitudes towards learning, why signal words versus any other tactic, and how effective it is in helping me identify the text relationships.

Next, the teacher uses coaching (i.e., guided practice) as learning opportunities are created for Joe to master the learning objectives of the strategy. Typically done in small groups, the teacher, Joe, and some of his peers, provide hints or reminders about the strategy as it is applied in authentic materials.

This suggests that the teaching/learning context is more effective if not done individually, isolated from other developmental learners. If I would arrange for Joe to come to my learning assistance center when one or two other developmental readers are available, I am more likely to have success. Not only can Joe commiserate and identify with other students having similar reading problems, but he is more likely to ask when he does not understand. This is only true if a collaborative climate of working together toward a common goal is established in this study group.

Sometime, hints by the teacher or peers are contradictory allowing for negotiation, discussion, dialogue, and reflection helping Joe and his study group to gain a deeper understanding (Tharp & Galllimore, 1989). This deeper understanding allows Joe and his study group to begin to convert the teacher's tactics into their own strategies. Discussion allows them to evaluate what they saw and heard during the modeling and to test out their coming cognitive and metacognitive knowledge.

Moreover, peer scaffolding allows Joe and his peers to be placed within a "zone of proximal development" (Vygotsky, 1962). That is, in a small study group with the aid of his peers and the teacher, Joe is better able to perform higher level cognitive and metacognitive strategies on more difficult tasks that he would be able to do alone. This is important while he is still learning how to perform the tactic. Joe need an opportunity to

experiment with this newfound knowledge within a supportive learning environment. Moreover, if authentic materials are used, Joe can begin to see the generalizability of the strategy to a variety of task demands.

Next, independent practice and fading are provided as Joe and his study group develops competence and self-efficacy. Unlike traditional apprenticeships which are task specific and training oriented, a Cognitive Apprenticeship instructional model requires developmental students like Joe to generalize a newly learned strategy to a variety of tasks and is more independence oriented (Rosenshine & Meister, 1994). All students in his study group are asked to apply the newly learned strategies to authentic tasks in other college classes. This connotes that the transfer goal of fading is fostered when the developmental student is enrolled in regular college classes. The practice of a remedial semester at some institutions reduces the opportunity for students to transfer their new knowledge and to decontextualize it to a variety of learning task demands. Joe and his study group are then asked to return with an evaluation of the effectiveness of the strategy and to discuss how they adapted it to the variety of learning tasks in which they were placed. During this fading stage, the purpose of instruction is for the teacher's ideas to become the student's ideas.

Also during this fading stage, Joe will be required to do sustained reading practice like sustained silent reading (SSR). Ask him to read non-required material for at least ten minutes, five times a week. Then, each week ask him to summarize what was read initially. Later on as he gets proficient, ask him to react to what he read. This self-directed response writing provides Joe with independent practice, further application of reading strategies introduced, and the multiple exposures to print needed for his vocabulary development and metacognitive

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evaluation of strategies. You can even have Joe e-mail "bookbuddies" from his study group or at other institutions around the country to expand their cultural and social interactions (Caverly & Broderick, 1993a; Myers, 1995; Nicholson, Peterson & Caverly,1995; Peterson, Caverly & McKool, 1994).

Strategy Scaffold

Which study-reading strategies should you to teach Joe? I suggest examining the research literature. Tadlock (1978) argues that SQ3R (Robinson, 1970)incorporates what we have learned about cognitive information processing. However, other analyses argue that SQ3R does not teach students to engage their prior knowledge, does not teach students to monitor their understanding based upon the task demands, and it requires several semesters of instruction before student ownership (Anderson & Armbruster, 1984; Caverly &Orlando, 1991b). In other words, teaching SQ3R is not recommended.

Another useful strategy for engaging the reader's background knowledge is the KWL-Plus strategy (Carr & Ogle, 1987). In this technique, students engage their background knowledge, set purposes for reading, attempt to categorize what they know prior to reading, monitor their understanding for whether the purposes were reached, and then create a map of the information. This strategy is more comprehensive than SQ3R incorporating before, during, and after reading tactics into one strategy. However, this strategy is teacher dependent and does not necessarily foster independence.

A more global strategic approach we can teach students is first and second degree MURDER (Dansereau, 1980). These strategies incorporate both general and specific textbook study tactics (i.e., first degree MURDER) as well as the stating of a goal for study, managing one's concentration, and monitoring progress toward the goal (i.e., second degree MURDER). Through a series of studies, Dansereau and colleagues (Dansereau, 1980; Holley & Dansereau,1984) have documented the effectiveness of this strategic approach particularly for low and middle ability level readers.

Another global strategy is PORPE (Simpson & Stahl, 1987). This comprehensive study strategy prepares students for planning, monitoring, and evaluating content area text as they prepare for essay exams. Research suggest students who learn to use PORPE perform better than control students on recognition and recall measures. Moreover, students tend to use effective strategies like PORPE when they see the transfer to success in the traditional curriculum (Simpson,

1996).

A fifth strategy, PLAN (Caverly, Mandeville & Nicholson, 1995),is a strategic approach to study-reading that leads students to perform specific reading tactics before, during, and after reading. The "P" step asks students to Predict the rhetorical text structure of the text by previewing and constructing a provisional map. That is, students preview the title and the introduction, predict what they believe the chapter will cover, and then construct a map with the chapter title as the trunk of a tree and the major branches of the tree represented by the structure of the chapter. Next, they preview the subtitles of the chapter and again add minor branches to this map to reflect this new knowledge gained by the subtitles. Then, they preview the highlighted words, graphics, and summary adding to the map each time new knowledge emerges.

Second, students are asked to engage and evaluate their prior knowledge using an "L" step which consists of Locating on the map where background knowledge exists or where it does not. That is, which branches on this map are old ideas and which are new. We ask them to evaluate these branches by placing check marks next to old ideas and question marks(?) next to new ideas.

Third, students read the chapter and perform the "**A**" step which stands for Adding new knowledge. As students read, they add new branches to this map as a notemaking or metacognitive strategy. They are taught to specifically focus into wherever new information has a question mark from the "L" step and to add a new, minor branch to the map when they understand. Moreover, students are taught to confirm those branches they

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checked as old information to verify their existing knowledge. If that existing knowledge was incorrect or if new examples are provided that extend existing knowledge, students are taught to make changes in their map.

Next, students perform the "N" step which occurs after reading. Here students Note whether the macrostructure of the material is indeed what they predicted prior to reading (i.e., typically they predict a categorization pattern). If the structure is different, they construct a new map to better represent the author's rhetorical structure.

This PLAN for reading provides a cognitive and metacognitive support structure for students as they come to understand what their role is in study-reading material at the college level. It builds from the SQ3R reading strategy, but incorporates current knowledge about schema theory, metacognitive processing, and macrostructures within expository prose. Like MURDER, it guides students to identify the important information in the text and to create a semantic map to represent the text structure, but it also guides their metacognitive monitoring of their understanding. Like PORPE, it guides students to predict and prepare for a specific task demand though it is more generic in its approach to a variety of task demands including objective as well as subjective tests. Unlike all of these other strategic approaches, however, students are taught not to be concerned over whether they follows PLAN exactly. Rather, they are taught the PLAN strategy as a solid procedural scaffold from which they can construct their own reading strategies to fit any task demands placed upon them in the future. Indeed, practice has documented that students tend to create a plan for reading (Caverly et al., 1995).

An extension of this strategy, PLANet (Caverly & Peterson, 1996), has been suggested where students are taught to place double question marks(??) during the Add step of PLAN next to words they have identified during reading they do not know and believe are important to know. They are taught to access the World Wide Web to search for first, a definition to form the link with one schema, and then, for examples of the word in a variety of sites (via search engines) to decontextualize the word. This process can reduce the lifetime of experiences poor readers need to quickly develop their vocabulary.

Writing Scaffold

A fifth scaffold for supporting students as they develop in a learning assistance center is journal writing. Here, students are encouraged to consider their existing declarative, procedural, and conditional knowledge and to document how that knowledge changes in their

interactions with an expert's strategies. Sometimes that expert is a teacher, a tutor, print, or even technology (Caverly & Broderick, 1991a). Each learning center visit should begin with a pre-learning journal which is used to engage prior knowledge and to establish a framework to which they will add or change new procedural knowledge. While students are learning new strategies through direct instruction or the Cognitive Apprenticeship model, they should stop and complete a peri-learning journal by adding to their pre-journals what they have synthesized about the strategies. Third, students should be required to apply these newly learned strategies to their classes and to complete a post-lab journal to confirm their application and understanding. Writing models the thinking, considering, and re-considering that is necessary for students to construct their own strategic approaches to text. Use of electronic (e-mail) can foster this process by easing the burden placed on the student and the teacher in attempting to arrange for synchronous meetings. Moreover, e-mail gives developmental students a skill for the twenty-first century, often a skill many of their more reading capable peers have yet to learn (Anderson-Inman, Knox-Quinn & Tromba, 1996; Broderick & Caverly, 1989; Caverly &Broderick, 1991b; Caverly & Broderick, 1993b; Myers, 1995).

Technology Scaffold

To support these five scaffolds, use technology (Caverly, 1996a; Caverly,1996b). Use networked computer to organize and map rhetorical text structures via outlining programs (Anderson-Inman, 1995/1996; Anderson-Inman & Horney, 1996/1997; Caverly & Broderick, 1991a; Caverly & Broderick,1992; Caverly & Buswell, 1988). Using a computer strengthens students' confidence in their growing ability to use language, and it allows students the opportunity to experiment with their new strategies as they come to understand their

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applications within a variety of material (Anderson-Inman & Horney, 1996/1997; Anderson-Inman et al., 1996; Caverly & Broderick,1989; Caverly & Broderick, 1991a; Caverly & Broderick, 1994).

Conclusion

Developmental reading education can be effective if it incorporates sound research, practice, and assessment (Stahl, Simpson & Hayes,

1992). Incorporating this research and the instructional implications via these scaffolds into the instruction of reading within a learning assistance center can foster improvement among your developmental students.

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