Delta Education Journal

Special Edition Devoted to Reading Issues
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July 20, 2005

Dear Colleagues,

You will note that this edition of the *Delta Education Journal* is devoted to reading issues. As educators, we should never underestimate the importance of the ability to read. Indeed, reading is the foundation of learning, and the key that unlocks doors leading to unlimited opportunities throughout a lifetime. Without the ability to read, those same doors remain securely locked.

Mississippi has made a concentrated effort to improve reading instruction and to highlight the role of parents and community in building support for reading. We are seeing the results of this effort in improved test scores throughout our state. If the focus on reading is continued, we will see enhancement of the lives of all Mississippian through the development of a more literate population. By maintaining the momentum for reading improvement, we will see results that benefit each of us.

We hope you enjoy this issue of the Delta Education Journal. Please contact us if you have questions or comments.

Sincerely,

Lynn J. House, Ph.D.
Dean
College of Education
A few years ago one of our authors administered an informal reading inventory (IRI) to a group of children. In calling the words on the word list, one second-grade boy said accurately with confidence, "engineer." In the eyes of many people, especially parents, the student "read" the word engineer. However, at the completion of the list, the test administrator asked, "What does engineer mean? What is an engineer?" With a puzzled look, he responded, "I don't know nuttin' about no engineer." The question to consider is, "Did the child actually read the word?"

Later during the IRI administration, every child who was supposed to read a story entitled "Exploring the Cave" said the story was about an explosion in a cave, even after being told the story's title. Undoubtedly, the children were assigning the meaning of a similar sounding word (explode for explore) in order to make sense of what they read. As a result, the meaning of the story was completely changed. The question now becomes, "Did the children actually read the story?"

Though recognized as an essential skill for every human being, the perception of what "reading" means is often distorted. To many, the child in the first scenario was reading because he could pronounce the word engineer. However, the task of reading involves not only the ability to decode and recognize words, but also the ability to understand or gain communication from what is decoded or recognized. Therefore, reading occurs when an individual's interaction with text results in successfully deciphering and gaining meaningful communication from that text. If one does not gain meaning from the text, one has not truly read the text.

Vital to the task of reading is the ability to use one's own knowledge to make sense of what is written. As noted in the second scenario, children use their prior knowledge and often resort to substituting similar sounding words that are in their meaning vocabularies in an attempt to understand what they read. Such prior knowledge
is acquired through experiences, whether vicarious (indirect) or concrete (direct), that result from interactions with the world around us. In essence, we understand print to the extent of our own experiences; therefore, children's understanding or comprehension of what they read is directly related to their own experiences (Cunningham, Moore, Cunningham, & Moore, 1995). It is these experiences that form an intricately woven, yet dynamic network of prior knowledge, or schema, that affords a reader the ability to both lend and garner understanding from written communication. Roe, Smith, and Burns (2005) concurred and stated that "a broad experiential background is essential for success in reading, because children must be familiar with the concepts and vocabulary they will see in written form in order to gain meaning from them" (p. 50).

Both of the aforementioned scenarios indicate a lack of experiences which provide the sensory stimuli through which an individual develops concepts and words about the world. In turn, it is the understanding of these concepts and words that form the foundation for reading comprehension (Hirsch, 2003). In the case of the word engineer, we wonder why that term had not been taught and reinforced via an introduction of trains and being read such books as Freight Train, The Little Engine Who Could, Hey, Get Off Our Train, Casey Jones, John Henry, and The Polar Express. Informational texts should also be included since they provide a wellspring of vocabulary that helps children develop and express knowledge about people and things (Neuman, 2001). Furthermore, informational text is an effective aid to understanding, especially when paired with a fiction book for which the reader needs background information.

Since prior knowledge represents what is known based on previous experiences (Harris & Hodges, 1995), teaching children to employ their prior knowledge to derive the author's intended meaning is an essential task for both home and school. Case in point: The authors would like to ask our readers to put yourselves in the following situation. Consider a fanciful story about a bat that goes to a field to play baseball with his friends. How would you interpret the story if the only bat you know about is a baseball bat and the only field you are familiar with is a cotton field? Further consider that as a child you actually played baseball in the cotton field behind your home. In this scenario, your limited prior knowledge, though quite legitimate, will certainly lead you to a faulty interpretation of the story. Books, such as Stellaluna, could be used to help readers of all ages to learn about bats in an entertaining way. This could provide background for
understanding any reading material concerning bats. Thus, parents and teachers must
deavor to engage children in the kinds of experiences that will build rich vocabularies,
including multi-meaning words, and knowledge about our world that facilitate the
development of efficient reading and writing skills.

The efficacy of exposing children to a myriad of experiences is supported by our
growing, yet ever evolving, knowledge of early childhood development. Psychologist
Jean Piaget unveiled the valuable jewels of the developmental stages of young children's
thinking abilities as a result of his belief that "children's thinking developed through
direct experiences with their environment" (Gunning, 2005). Likewise, Lev Vygotsky, a
Russian psychologist, recognized the social factors that influenced children's thinking
abilities. He theorized that as children interacted with more knowledgeable adults or
peers, they could gain knowledge and skills that would allow them to reach their
maximum learning potential (Roe, Smith, & Burns, 2005). Brain research also verifies
that as children interact with their surroundings through exploration, oral language, play,
and attempts to replicate adult behaviors, they develop and build the prior knowledge
upon which they will later rely for understanding written communication.

Equally important for parents and teachers is understanding the effects of
different kinds of experiences as revealed by Edgar Dale. In 1946 Dale published his
now classic Cone of Experience (1946, p. 39) which graphically depicted the types of
experiences people have. He used a cone (or pyramid) shape to indicate that concrete,
direct experiences (Activities of Action) form the base for building background
knowledge which in turn aids in learning concepts and vocabulary. Practically speaking,
most vicarious experiences (Activities of Observation) are also useful. As experiences are
deemed more limited for learning and schema building (Abstract Representations), they
are indicated as the top of the cone narrows; however, the effectiveness of the more
abstract experiences can be enhanced in combination with the activities of action and
observation. The authors of this article have modified the cone (see Figure 1) to include
contemporary practices that may be used by teachers and parents to build rich vocabulary
and background knowledge, thus promoting reading success. A description of each tier of
the cone follows.
Activities of Action

1. Direct, Purposeful Experiences involve learners in an activity in a direct, concrete, hands-on way. As children use their senses to engage in direct activities, they construct knowledge based on first-hand experiences. The more senses involved, the more learning takes place. For example, popping popcorn could engage all senses, thus developing background knowledge rich in words that describe scents, sounds, sights, textures, and tastes. Participation in all of the fine arts provides important experiences. Art, music, and drama enhance and reinforce the learning of concepts which provide background experiences.

2. The Language Experience Approach, an instructional technique that includes a common experience, discussion, and written product, is most effective when based on a direct experience. However, it could be an outgrowth of a shared or vicarious experience. Following the experience, the teacher or parent asks open-ended questions to elicit discussion. As a reading approach, the child dictates a story about the experience. The teacher or parent writes the child's words, reads it back while pointing to each word, and encourages the child to read it. The story should be saved for frequent rereadings. Additionally, published books containing the same theme should be read to reinforce and build new vocabulary.

3. Contrived Experiences, Simulations involve actions that simulate the "real" experiences. For example, visiting a hands-on museum, a child could "fly an airplane" or “shop for groceries” in a pretend store. Learning centers help build background and aid in problem solving as students engage in adult-like responsibilities, such as cooking.

4. Dramatic Participation may closely resemble Simulations. For example, a reenactment of the first Thanksgiving could include cooking, making candles, playing colonial games, and wearing Pilgrim and Native American costumes. Such activities allow children to filter the experiences through the eyes and feelings of others. Dramatizing books helps students to grow in language skills and knowledge of story elements.
Activities of Observation

1. **Shared Book Experience** combines action and observation. It involves teacher or parents reading aloud while pointing to the words and asking questions that encourage predictions and comprehension. The books appropriate for this approach should include as many of these elements as possible: rhyme, rhythm, repetition, predictability, illustrations that aid in text comprehension, and an interesting story. As the child feels comfortable doing so, he/she should be encouraged to read along or voluntarily *read* all or parts of the book alone. Noting that many children are able to memorize repeated readings, the *reading* they exhibit is a positive and motivating beginning to real reading.

2. **Demonstrations** are activities that are observed. For example, a child might watch a science experiment. However, if at all possible, involve the child. Likewise, allowing a child to observe and eventually participate in the planting of a flower garden can foster the development of science vocabulary and concepts. Resource people can be very effective in building background knowledge as they demonstrate and exhibit their interests, especially as they use and reinforce terms associated with their areas of expertise. Some suggestions include a potter, a florist, a dentist, and an animal trainer.

3. **Field Trips** involve going to a new environment that utilizes many senses to learn new concepts and vocabulary. For example, going to a bakery could involve sight, hearing, smell, touch, and taste. A field trip should, if at all possible, include direct experience with as many senses as possible.

4. **Exhibits** are especially good for seeing and hearing about science and social studies topics. Museums have exhibits, such as wildlife, pioneer life, space travel, etc. Museums that allow children to interact with artifacts and objects engage more senses, thus increasing the learning benefits.

5. **Motion Pictures, Television, and Videos** capitalize on the affective, or emotional, domain of learning that involves interests and attitudes. Media has the uncanny ability to capture and hold the attention while entertaining and informing the viewer. It is a good source for motivating further reading, study, and learning about a topic. However, the use of all media, including the
computer, should be carefully screened. Comparing a book with its movie promotes critical thinking.

6. Radio, Recordings, and Still Pictures help serve the purpose of building background for reading through the use of imagery. For example, if a child has never been to the mountains, pictures help clarify what they look like. Mountain folk music could be played while showing the pictures or reading a book set in the mountains.

Abstract Representations

1. Books allow children to go places through the stories and information contained in them. Reading aloud to children is one of the most important things parents and teachers can do; the benefits are well-documented. While reading aloud, as well as guiding students' reading, it is also important to ask predictive and comprehension questions to direct the listeners or readers in accurately understanding and evaluating the text. Ask a variety of types of questions which may begin with Who?, When?, Where?, How?, and Why? Students will gain greater understanding of verbal and visual symbols as the teacher or parent interacts with both the text and the child. Using props also helps to make the book come alive.

2. Visual and Verbal Symbols are the graphic symbols and spoken words that comprise written and oral communication. Students very often encounter these visual and verbal symbols in books they read or ones read to them. Utilizing the least amount of senses for perception, spoken words, written words, and logographic symbols are limited in their ability to stand alone as effective instructional experiences. In fact, one must possess prior knowledge of a symbol before that symbol can represent any meaning. Since verbal symbols are an infant's first encounter with language, engaging them in conversation while helping them to use their senses to interact with the world around them will lay a fertile garden in which rich vocabulary and extensive background knowledge will grow.
Figure 1.

Cone of Experience

Abstract

Concrete

Abstract Representations

Visual and Verbal Books

Radio, Recordings, Still Pictures

Motion Pictures, Television, Videos, Filmstrips, Computers

Exhibits

Field Trips

Demonstrations

Shared Book Experience

Dramatic Participation

Contrived Experiences, Simulations

Language Experience Approach

Direct, Purposeful Experiences

by Edgar Dale, 1946
Modified by Janie Allen-Bradley and Corlis Snow, 2005
Italicized additions denote modifications
Although visual and verbal symbols in themselves are least effective for instruction when used alone, talking to children and eliciting discussion from them should accompany all experiences in order to build and reinforce concepts and vocabulary. As human beings, any experience, whether concrete or abstract, leaves an impression in our minds. Nevertheless, the more direct an experience, the deeper the impression. It is well understood that feasibility sometimes disallows the rich, concrete experiences that are desired for children. For example, while reading a story about a gigantic rhinoceros, looking at a picture or watching a video is obviously much more feasible than hauling a rhinoceros into a bedroom or classroom.

In conclusion, the authors issue a challenge to our readers who influence children. Seize every opportunity to provide valuable experiences for those children right from birth. It is important to be patient and positive in dealing with these vulnerable minds and self-concepts because children will more likely reach their potential with praise for small steps in their development, as opposed to criticism for mistakes. If you help the children to become risk takers with many and varied experiences, you will ultimately facilitate acquisition of the background knowledge they need to become good readers.

References


Strategic Questioning for Sound Literacy Instruction

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Delta State University

The scientific literature resonates with the cry for literacy instruction that produces strategic readers. Implicit to this plea is the notion that readers should apply some strategy to their reading, and that applying such strategy will result in improved comprehension, the product of reading. Essential to this process is developing in the reader the ability to respond to a variety of types of text requiring different types of comprehension, with questioning providing the means to the end (Day & Park, 2005). Roe, Smith and Burns (2005) present compelling research that indicates that questions do indeed foster increased comprehension, from simply requiring students to attend more closely to their reading in order to answer questions, to improving inferential skills and ultimately more complex reasoning skills. Gunning (2000) cites two representative studies in support of leading students to higher levels of comprehension through teacher questioning. In the first, Pressley (1994) reports that even a simple “Why?” question can help students retain information. The second, a study by Sundbye (1987), describes how teacher questioning helped a group of third-graders construct an elaborated version of a story. Their answers to inferential questions asked during their reading of a story later surfaced in the retelling of the story, having become a part of their memory.

Therefore, the old adage that “you get what you ask for” rings true with regard to questioning during reading instruction. Teachers typically ask many spontaneous questions during the course of a reading lesson. Unfortunately, this often results in questions that are more detail oriented since these are easiest to construct. A second pitfall of this type of question is associated with their wording. Hastily formed questions are often phrased poorly and tend to be vague, leading to misinterpretation on the part of the learner (Roe et al., 2005). Nor do they result in a structured series of questions that lead progressively to more complex thinking and the application of a comprehension strategy. Though it may take much practice and study to perfect the practice of asking questions that help readers structure thinking and unlock the essential messages of text, literacy teachers can improve their instruction immediately by carefully thinking about how they plan for questioning throughout the reading lesson. Admittedly, the act of
reading is such a complex scientific process that an effective reading teacher will most likely spend years of study to attain the knowledge and skills necessary to deliver high quality literacy instruction. Further, while strategic questioning sounds like a rather straightforward and sensible practice, in reality it requires much planning coupled with critical thinking to put into practice. The author suggests a framework for planning that will enable teachers, whether novice or veteran, to use questioning strategies that will improve the comprehension skills of their students.

The Use of Taxonomies

A good questioner makes use of the tools available to help formulate and sequence questions so that they lead readers logically to the highest level of thinking possible, and consequently, to a deeper understanding of the text. When used judiciously, taxonomies can be quite helpful in developing questions. The term taxonomy refers to a descriptive system for classifying objectives, questions, or skills (Gunning, 2000). Typically, the taxonomy is arranged hierarchically, with levels progressing from simplest to most complex. Whether a teacher views a taxonomy as a hierarchy with dependent levels or as a set of options to be exercised as deemed appropriate, it provides a helpful language in which to think and talk about questioning (Temple, Ogle, Crawford & Freppon, 2005). A number of classification systems exist for use in developing questions. Bloom and his associates developed a taxonomy for measuring school goals and assessment in 1956. Educators quickly grasped this tool for use in planning classroom questioning, and though it has been modified and adapted many times through the years, its basic concepts endure today (Temple et al., 2005). Bloom’s Taxonomy (1956) identifies six levels, progressing from the most basic thinking at the knowledge level, through thinking tasks that require comprehension, application, analysis, synthesis and evaluation. While several adaptations of Bloom’s Taxonomy are specific to the teaching of reading, teachers may want to consider using a detailed system developed by Barrett (1972) which provides four categories of questions and places emphasis on the reader’s emotional response to the text. A brief overview of the levels of this taxonomy is provided in Table 1.
Table 1
Barrett’s Taxonomy of Reading Comprehension

<table>
<thead>
<tr>
<th>Level</th>
<th>Associated Functions or Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Literal recognition or recall</td>
<td>Recognition or recall of details, main ideas, sequence, comparisons, cause and effect relationships, character traits</td>
</tr>
<tr>
<td>Inference</td>
<td>Inferring supporting details, sequence, comparisons, cause and effect relationships, character traits, predicted outcomes, meanings association with figurative language</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Judgments of reality or fantasy, fact or opinion, adequacy or validity, appropriateness, as well as worth, desirability and acceptability; judgments must be based on valid criteria</td>
</tr>
<tr>
<td>Appreciation</td>
<td>Emotional response to the text content; identification with characters or incidents; reaction to the author’s use of language and the subsequent generation of imagery</td>
</tr>
</tbody>
</table>

Pearson and Johnson (1978) offer yet another way to categorize and consider question types. Influencing these researchers is the belief that it is the reader’s interaction with the text that produces comprehension (Scales & Shen, 2004; Roe et al., 2005). They suggest that teachers consider three levels of questions (identified in Table 2) as they relate to the text being read.

Table 2
Pearson and Johnson’s Classification of Question Types

<table>
<thead>
<tr>
<th>Level/Type of Question</th>
<th>Associated Functions or Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Textually explicit</td>
<td>Answers are directly stated in the text; often referred to as “reading the lines”</td>
</tr>
<tr>
<td>Textually implicit</td>
<td>Answers are determined by reader understanding implications based on clues stated in the text; often referred to as “reading between the lines”</td>
</tr>
<tr>
<td>Scriptually implicit</td>
<td>Answers are dependent upon reader’s background knowledge; often referred to as “reading beyond the lines”</td>
</tr>
</tbody>
</table>
Barrett’s Taxonomy (1972), used in conjunction with Pearson and Johnson’s Classification System (1978), provide a means for considering comprehensively both the text being read and the variety of thought patterns at different levels required for full comprehension of the text. However, caution must be exercised when using taxonomies. While they inform practice, if overanalyzed, they can become counterproductive. Debate continues as to whether the levels are truly hierarchical, with progression to the next level dependent upon satisfaction of the previous level, or whether they are interdependent. For the purposes of the framework outlined in this article, teachers are encouraged to use the taxonomies to develop sound questions on a variety of levels and pose them strategically to students throughout the reading lesson. They need not become highly charged with controversy, as taxonomies are by their very nature clouded with gray areas. Teachers must seek to understand the spirit and logic of the taxonomies, and apply them reasonably and practically.

Planning for Strategic Questioning Before, During and After Reading Instruction

According to a model presented by Cunningham, Moore, Cunningham, and Moore (2000), there are three distinct phases in a reading lesson. The quality of the instruction is dependent upon the quality of the questions that are presented to the reader throughout each phase. There are abundant resources available to teachers who wish to implement specific strategies and activities to enhance the process. Therefore, this framework for the planning of the reading lesson will highlight the nature of the questions to be used rather than activities for promoting them. Emphasis on the methods of instruction and the role of questioning associated with each of these three phases is prevalent in the literature (Roe et al., 2005; Gunning, 2000; Temple et al., 2005).

The pre-reading phase calls for the teacher to introduce the reading selection and build the reader’s schemata (background) related to the topic of the reading passage. Naturally, an essential first step in planning is to become informed about the content of the reading. A deep understanding of the passage, the author’s purpose for writing, and the comprehension strategy that will most successfully unlock the message is foundational to planning. Only then can questions be posed that direct students’ thinking to the essence of the story or passage. Probing questions that call for students to link previously held notions with new information, or to confirm or refute ways of thinking
are key to building rich background. Pictures and objects that cue readers and prompt thinking are recommended. It is also during this phase that the student makes predictions about and establishes purpose for the reading that will ultimately lead to an enhanced sense of ownership of the reading. The use of predictions is closely tied to establishing purpose for the reading. It is important that predictions not be presented as “guesses,” but that they are reasoned assumptions based on clues provided in titles, through illustrations, through the reading of introductory paragraphs, or perhaps through past reading experiences. How well students predict—and the degree to which they link predictions to purpose setting—are dependent upon the line of questioning the teacher pursues. Rhetorical questions are to be avoided. For example, asking obvious questions about what one sees in a picture may or may not be significant to the story line. If the color of a character’s shirt does not impact a key event in the story, it probably does not need to be asked. Readers’ predictions set the stage for purpose-setting, as they will certainly want to read to find out if they predicted accurately. Questioning should also lead students to question the validity of their predictions. Ultimately, good readers are able to pose their own purpose-setting and comprehension monitoring questions. Teacher modeling, perhaps through a think aloud, sets the stage for readers to reciprocate. In fact, this shift in thinking should be encouraged.

Though different models of planning place vocabulary development at different stages, this author suggests that key vocabulary words be introduced prior to reading. Questions at all levels of the taxonomy may be employed here, dependent upon the vocabulary word under study. For example, rather than merely presenting the literal definition of a word, a teacher might lead students to develop analogies that show how two ideas are related, or to compare and contrast two concepts. After all, one would have a much better idea of what a monarchy is through its comparison to a democracy.

The heart of the pre-reading instruction is the development of a comprehension strategy that will be applied to the story. The identification of an appropriate strategy, followed by teacher modeling that utilizes appropriate questioning, is key at this point in the lesson. A familiar passage is typically used in the modeling phase (Cunningham et al., 2000). Planners must be careful to match the strategy with the selection. For example, teaching students to identify how a sequence of events impacts the outcome of a story is a valid comprehension strategy. Yet, a common mistake made in the application of this
strategy is the tendency to have students learn a sequence of events that bears no particular relevance to the outcome of the story. Take, for example, the story *Alexander and the Terrible, Horrible, No Good, Very Bad Day* (Viorst, 1972). In this rather charming story, the main character, Alexander, undergoes a series of quite unfortunate events, making for a rather miserable day. Yet, the events are independent, not to mention numerous. A commonly applied comprehension strategy for this selection is sequence of events, although it does not matter in what particular order one remembers or considers the events when establishing the main idea of the piece. Also, having students memorize a long list of events that are not related is basically just an exercise in memorization. With reference to understanding this particular piece of literature, the strategy of drawing conclusions would be more appropriate to apply.

Further, in modeling the appropriate comprehension strategy, it is necessary to model the self-questioning thought process that a good reader goes through to pose and answer strategic questions. These then serve as the framework for the reader as he applies the same strategy in the new reading passage. Consider the questioning that takes place when students are asked to identify cause and effect relationships. First, one must question if an incident or outcome has a specific cause (possibly a literal or inferential level question). If so, one must then question further to identify the source or the cause (again, may be literal or inferential). Next, one must question whether this relationship has any particular bearing on the outcome of the story (requiring inferential and/or evaluation level thinking). The reader is then poised to make judgments about characters’ actions (evaluation level) and to respond personally to the actions of a particular character or characters (appreciation level). Upon closer inspection of these hypothetical questions, one can easily see the need to help the reader discern which can be answered directly in the text (textually explicit), which can be inferred (textually implicit), and which require the reader to think beyond the text (scriptually implicit). Therefore, the two taxonomies described earlier in this paper take form in the active teaching of the lesson.

The stage has been set for strategic reading. How well students apply these strategies is to a large degree dependent upon the types of questions the teacher poses during reading, as well as the sequencing of the questions. During this phase of the lesson, teachers should pose questions that help students self-monitor, but which are not obtrusive. Students’ answers, comments and questions throughout the reading of the text
provide cues to the teacher as to how to assist students. Asking students leading questions related to the purpose for reading and the application of the target comprehension strategy are appropriate here. Students might also be asked to determine if they are able to support or refute predictions as they read. Teachers should also understand that questions do not necessarily need to be in interrogative form. Statements such as “Tell me how you know this...” or “Tell me more about...” satisfy the purposes of questioning while couched in a more inviting and accepting tone. Through this exchange, insight is gained into the reader’s thought processes and the door opens for the teacher to further elaborate upon the comprehension strategy, the meaning of a vocabulary term, or some other aspect of the content or a skill. Questioning that takes place during reading is perhaps the most difficult to navigate, in part because it is to a large degree dependent upon the reader’s reaction to the text. Nonetheless, careful thought to planning should provide the teacher with direction for expanding upon readers’ ideas or redirecting them, as well as for appropriate scaffolding of ideas. Care should be given not to interrupt the reading process. The goal is fluent reading with comprehension. Too much “stop, question, and discuss” interrupts this flow. Questioning throughout this phase should be subtle, clearly tied to the purpose for reading, and dependent upon the needs of the reader (Cunningham et al.)

Questions at all levels of the aforementioned taxonomies come into play throughout the reading, though it is natural that some evaluative and appreciation level questions are more appropriately posed at the conclusion of a piece, when enough information is available to the reader to make a more informed response. Pearson and Johnson’s Classification System (1978) is quite helpful during this phase in leading the reader to discern between information that is available by questioning the text and information that is dependent upon the reader’s schemata. A teacher, in helping a reader to make this distinction, might ask the reader to qualify an answer as a “right there (in the book)” or “on my own” answer, thereby helping to establish the question-answer relationship (Raphael, 1986).

The post-reading phase, while calling for a full range of questioning on all levels of the cited taxonomies, is unique in that its primary purpose is to bring the reading into focus, so that the essence of the communication is realized by the reader. Follow-up questioning will closely parallel that used during reading, as both sets of questions are
focused on the purpose for reading. However, during the post-reading phase, group interaction becomes important and readers are expected to relate their ideas to those of others and expound upon or extend their thinking. Higher-order questions such as “How else might this character have reacted?” or “Can you think of other ways to solve this problem?” require creative thinking on the part of the reader. Students are called upon to work at the appreciation level of Barrett’s Taxonomy (1972) when they are asked to relate to characters or at the evaluation level when they determine how well an author fulfilled his purpose for writing. In addition, the post-reading phase is an optimum time to expand understanding of vocabulary, as readers now have more experience with the word in context. Comparisons may be called for or a reader might share the self-questioning strategies used to determine the meaning of a word. Again, this phase should lead the reader to bring the selection into focus through retelling and summarization, and extend the reading for application beyond the printed page and the current reading selection. The work of the literacy instructor will be to wisely choose questions that reflect where students are in terms of the process, and that do not unnecessarily reduce this phase to a bombardment of questions. While comprehension questions serve the dual purpose of teaching and assessing, the goal is to lead students to be independent readers who are skilled at employing strategic questioning automatically as they read.

Ultimately, the reader will be asked to apply the skill to a new reading selection, where the reader’s use of the skill is most appropriately evaluated. Extension activities that require the reader to think and write about what has been read bring the process full course. A subtle shift from teacher as questioner to student as questioner should now be in place.

Conclusion

With the concentrated focus that the topic of literacy instruction receives today, it is easy for a literacy teacher to become overwhelmed with questions such as “Where do I start?” and “How do I pull this together so that it makes sense?” An overwhelming amount of resources are available and, while helpful, they can become unmanageable, fragmented, or reduced to an approach to teaching that is quite scripted. Teachers wishing to get to the essentials of providing sound literacy instruction cannot deny the preponderance of research that substantiates the link between sound questioning and improved comprehension. Wise teachers must find their own roles and voices, and those
of their students, in posing meaningful questions that will lead not only to the full comprehension of the text at hand, but ultimately to the development of independent and strategic reading habits in students.

References


Barksdale Reading Institute: Emphasizing Reading in K-3 Classrooms

Katie Tonore
Barksdale Reading Institute

Barksdale Reading Institute (BRI) is designed to improve significantly the pre-literacy and reading skills of children from birth through 3rd grade. The initial model for this effort was the Mississippi Reading Reform Model. Although BRI has significantly modified the Mississippi Reading Reform Model, it remains the cornerstone of BRI’s work in the schools.

Jim Barksdale, former CEO of Netscape, and his late wife, Sally, invested $100 million through the University of Mississippi Foundation to start the reading institute in 2000. BRI is in its fifth year (2004-2005) of implementation and involves more than 20,000 K through 3rd grade children, several thousand children attending childcare centers and Head Start programs, over 1,100 public school teachers, and hundreds of daycare providers and Head Start teachers on a yearly basis. BRI is presently in 70 Mississippi schools that are selected according to low reading test scores and the local staff’s commitment to working with the institute.

Because today’s children are growing up in an information age in which reading and writing play a critical role (both economically and socially) the importance of literacy cannot be oversold. More than ever before, teachers need to know how to help young children become successful readers and lifelong learners.

The Institute’s CEO is Claiborne Barksdale, Jim’s brother, who works out of the Oxford office along with former state superintendent of education, Richard Boyd, BRI’s Director of Education. Kelly Butler, Director of Regional Reading Coordinator Support, heads up the Jackson office.

The Institute employs 11 Master-level reading teachers called Reading Regional Coordinators (RRC’s). Each RRC is assigned to implement BRI components one day per week in 4-5 schools. Some of the duties of the RRCs include observing classroom reading instruction, modeling instruction in classrooms, conducting two-hour weekly Peer Coaching Study Team (PCST) meetings, assisting teachers in maximizing core
reading instruction, and conducting professional development for teachers, assistant teachers, tutors, and childcare providers.

Each BRI school names a BRI Liaison who provides support and coaching in the absence of the RRC, oversees ordering of books and materials, and assists the RRC in collecting monthly implementation data. Each year, the Liaison assumes greater responsibilities for leading PCST.

Generally, BRI stays in a school five years; however, schools that show high levels of implementation move to GRAD school status which means that they are still part of BRI but receive funds only for the Liaison supplement and receive less technical assistance from BRI as in previous years.

Components of the Barksdale Reading Institute

Schools that qualify are asked to submit a grant. The grant selection is competitive and schools must have a clear understanding from the outset about what BRI work entails in order to achieve complete implementation and achieve the greatest results for students. The components of BRI are: Classroom Management, Professional Development, Core Reading Instruction, Small group Instruction, Interventions, Reading Tutorial Partnerships, and Early Literacy/Parent Connections.

Classroom Management. Effective teaching follows an orderly, well-organized classroom where learning is valued and teachers and students respect the process. Training and support is provided for teachers in effective classroom management techniques and class scheduling of BRI components.

Professional Development. Changing practice that leads to improved instruction requires training, reflection, modeling, and sharing of ideas. The RRC provides teachers with professional development through the two-hour weekly PCST meetings. BRI has developed the Reading Universe, which is a professional development guide for K-3 teachers to improve core-reading instruction. It is an outline of the skills of the “universe” of skills that all teachers should know and be able to teach. The Reading Universe recognizes that teaching reading is a developmental, non-linear process, therefore, “what” and “when” skills are taught depends on the learning style and instructional needs of the child. Table 1 shows the Reading Universe Grid. The Grid reflects the fact that the Reading Universe is rooted in oral language development and is supported by exposure to children’s literature. Three strands, print awareness, word recognition, and word usage
for meaning run across the top of the Grid and contain the elements of reading (Concepts about Print, Phonological Awareness, Decoding, Vocabulary, Fluency, Comprehension).

Additionally, private childcare providers and Head Start teachers receive training in the areas of Concepts about Print, Phonological Awareness, Pre-K assessments, and modeling in how to read-aloud to Pre-K students.

Table 1: Reading Universe Grid

<table>
<thead>
<tr>
<th>PRINT AWARENESS</th>
<th>WORD RECOGNITION</th>
<th>WORD USAGE FOR MEANING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concepts about Print</td>
<td>Decoding</td>
<td>Fluency</td>
</tr>
<tr>
<td>Knowledge of Book Concepts</td>
<td>Segmentation of Sentences into Words</td>
<td>Long vowels with phonetic notation</td>
</tr>
<tr>
<td>Recognizing Directional Concepts about Print</td>
<td>Syllable Manipulation</td>
<td>R-controlled Vowels</td>
</tr>
<tr>
<td>Recognizing Structural Concepts about Print</td>
<td>Rhyming</td>
<td>Graphophonics &amp; Alphabetic Principle</td>
</tr>
<tr>
<td>Recognizing Meaning Concepts about Print</td>
<td>Alliteration and Assonance</td>
<td>Other Vowel Sounds &amp; Schwa</td>
</tr>
<tr>
<td>Recognizing Phonological Concepts about Print</td>
<td>Onset and Rime</td>
<td>Sight Words</td>
</tr>
</tbody>
</table>

**Components of Fluency**
- Monotone
- Smoothness
- Accuracy
- Rate
- Integration

**Components of the Comprehension Process**
- Predicts, reads, retells, summarizes
- Paraphrasing, graphic organizers, predicting, answering questions

**Non-Fiction Text Elements**
- Purpose, feelings, facts
- Summarizing, paraphrasing, causes and effects
- Questions

**Fiction Text Elements**
- Setting, characters, theme, mood
- Conflict, solution, plot, conflict
- Predicting, retelling

**Vocabulary**
- Word recognition and comprehension
- Positive Talk: Building confident learners and readers

**Use of Quality Children’s Literature at Appropriate Levels to Support Reading Instruction**

**Use of Centers and Small Group Instruction**

**Ongoing Assessment/Screening**

**Ongoing Assessment/Diagnostic**

**Assessment in Various Tests**

**Reader’s Workshop**

**Introduction**

Adapted from models by Dr. Janie Allen-Bradley and Dr. Margaret Pope - The Barksdale Reading Institute © 2005.
BRI believes that a school principal’s commitment and leadership are the most significant factors in determining the extent to which a school benefits from working with BRI. Therefore, BRI requires that the principal demonstrate in-depth knowledge of the BRI grant, attend 50% of the PCST meetings, and attend BRI Principal Leadership meetings held in Jackson. Upon confirmation that a principal has completed the requirements, BRI contributes $2,000 to be used to purchase books, other supplemental reading materials, or for use in implementing pre- or after-school literacy activities, or other such literacy-related activities.

Core Reading Instruction. Core reading instruction occurs during a minimum of a ninety-minute uninterrupted block of time. Training is provided by BRI in explicit research-based instruction, appropriate use of whole-group and small-group differentiated instruction, administering and analyzing assessments, and effectively utilizing reading materials, including the school’s chosen basal series. BRI recommends the use of the Texas Primary Reading Inventory (TPRI) as a diagnostic instrument to be administered at the beginning of the year, mid-year, and at the end of the year. The TPRI is designed to determine the specific reading problems that students have. The teachers evaluate the results, group children according to similar skills needed, and prescribe interventions to address the diagnosed problems of targeted students. The Peabody Picture Vocabulary Test-R will be available for use by kindergarten teachers in the fall of 2005 to help assist in determining the language needs of their students.

Small group instruction/learning centers/cooperative learning. BRI emphasizes small-group instruction and cooperative-learning techniques that allow teachers to work in small similar-skill based groups while other students are engaged in literacy-related activities under the supervision of the teacher assistant.

Interventions. All children below proficient level in reading determined by results of the Mississippi Curriculum Test (MCT) or TPRI receive individual or small-group interventions performed by the classroom teacher. Training is provided for teachers in finding the lowest deficit skill as identified through assessments, finding appropriate strategies for interventions, and the effective use of materials used for interventions.

Reading Tutorial Partnerships. Struggling readers benefit enormously from listening to fluent readers read and from regular opportunities to practice reading. BRI funds may be used to pay for such tutors, and assistant teachers/tutors are provided
training in how to provide quality, one-on-one reading tutorial partnerships. BRI also trains volunteer tutors to work with individual children on fluency and comprehension skills. These tutors work primarily in the schools with which BRI works, but BRI has also trained tutors who work in other schools. To date BRI has trained 668 such tutors.

*Early Literacy/Parent Connections.* Home and Pre-K involvement in literacy support is very important. BRI provides services to parents, teachers and children in private and Head Start programs. Each child in a BRI school receives a minimum of three books each year from participation in the Reading is Fundamental (RIF) program each year.

**BRI Results**

The effectiveness of BRI’s efforts is measured in a variety of formal and informal ways. BRI constantly monitors the degree and accuracy in which implementation is occurring, and based on that implementation, changes are made. The essential measure of BRI’s effectiveness, however, is the MCT. The MCT is administered in the spring of each year to grades 2-8 in reading, language arts, and math. BRI receives the results of the MCT reading test in mid-July and performs an in-house analysis of those results. BRI also uses outside entities to evaluate the scores in BRI schools versus *comparable* non-BRI schools.

The results for the first four years of BRI’s work have shown that BRI has made a *statistically significant* impact. Thus, the year-over-year improvement in BRI’s schools versus *comparable* schools has demonstrated a difference in the reading scores that is attributable to BRI’s efforts in the schools with which it has been working. BRI believes that it can and must see even greater results so that it can be said to be making a *practically significant* difference in schools. BRI is constantly changing core elements of its work in the schools. The most significant changes that BRI has made recently include the development of the Reading Universe and the increased emphasis on improving core reading instruction in the K-3 classroom. Additional, significant changes are expected to be made in the future as BRI continues to work to maximize its effectiveness.

**BRI Collaboration**

BRI collaborates with the following entities to implement BRI components in Mississippi’s elementary schools: State Board of Education, Mississippi Department of
Education, Mississippi public universities and private colleges, Higher Education Literacy Council, Mississippi public elementary schools, Mississippi Public Broadcasting, private childcare providers, Early Childhood Institute, W.K. Kellogg Foundation, Day Foundation, Herrin Foundation, U.S. Department of Education, Hardin Foundation, Head Start, parents, and civic and other volunteer organizations. BRI has also collaborated with individuals, groups and civic organizations to train the volunteer tutors that it has placed into Mississippi classrooms.

One must be an inventor to read well. There is creative reading as well as creative writing.

If the riches of the Indies, or the crowns of all the kingdom of Europe, were laid at my feet in exchange for my love of reading, I would spurn them all.

- Ralph Waldo Emerson
Reading Reform in Mississippi

Bonita Coleman-Potter, Ph.D.
Mississippi Department of Education

The state of Mississippi has embarked upon a new challenge and has extended the horizons of our children. The Mississippi Reading Reform Model (MRRM)...Every Child a Reader, guided by several goals and action steps, was researched and designed to break the mold of traditional reading instruction for this state. The MRRM was developed by Mississippi education practitioners to strategically address readiness and reading improvement in the state with the implementation of scientifically-based best practices. It is our intent that the educators of this state, in partnership with parents and families, will develop children who read well and independently by the end of the third grade.

Reading has been and continues to be one of the most intensively researched content areas of the past several decades. Unlike other content areas, reading has an evidenced-based core body of knowledge that outlines the critical areas that must be addressed in order for children to learn to read successfully. These critical areas have been translated into the four reading research conclusions that are the foundation of the MRRM:

- Well-designed early literacy interventions to ensure reading readiness;
- Prescriptive direct instruction utilizing the essential elements of reading instruction and based upon the results of appropriate assessments;
- Extended instructional opportunities for children; and
- High quality professional development to improve reading instructional practices of Mississippi teachers, administrators, and support staff.

While there is certainly room for growth and improvement in reading achievement both nationally and in this state, Mississippi has made tremendous strides in reading performance. According to the National Assessment of Educational Progress (NAEP) Reading Report Card for the Nation and the States, Mississippi was one of only seven states evidencing a significant increase in the percentage of fourth-grade students
scoring at or above the “Advanced” level of reading on NAEP. Mississippi was also the only state evidencing an increase in 4th grade students scoring at the Proficient level. In 1998, Mississippi was one of seven states in the Nation recognized by the National Education Goals Panel for raising reading achievement. Mississippi received gold stars from the panel for greater than expected gains in the percentage of students scoring at the proficient level between 1992 and 1998 on NAEP. In addition, the state consistently reduced the percentage of fourth graders scoring below basic achievement from 1992 to 1998 (NAEP, 1998). The percentage reduction, from 59% to 52%, demonstrates significant progress as compared to the Southeastern region and the National average scores percentages.

Nonetheless, Mississippi consistently performs poorly on cross-state comparisons of reading performance. Certainly, it is true that many influences beyond the control of educators have a profound impact on the educational achievement of our children. These include the parents’ educational attainment levels, number of parents and siblings in the home, poverty and socio-economic statuses. In Mississippi, for example, poverty status accounts for approximately 67% of the variance in reading ability. This correlation indicates that a relationship between poverty and reading exists, although it certainly does not describe the reasons and limits for the relationship. We can only be certain that poverty sets an upper limit on what can be done under the conditions in which this correlation was made, unless there is a substantial change in the manner and methods utilized in educating children. Schools that have fully implemented the scientifically-research based reading practices are succeeding in breaking the mold by surpassing the typical expectations generated by poverty and background.

To support the establishment of the MRRM, the Mississippi Legislature enacted a Reading Sufficiency Law during the 1998 Legislative Session. This law requires every school district to establish and implement a program for reading reform. In addition, funds appropriated by the state legislature were used to pilot the MRRM in six of Mississippi’s low-performing school districts and the model has been replicated by the Barksdale Reading Institute and federally funded reading improvement models.

The reading gains made in each of the six pilot school districts of the Mississippi Reading Sufficiency Program, Barksdale Reading Institute Schools, and the federally funded Reading Excellence and Reading First program provide evidence that systemic
reading reform in this state is critical in meeting the needs of struggling students. However, this is only a first step in directing the focus of the instructional leaders of the state. First and foremost, must come the realization that guidance is needed in articulating the basic reading and readiness related competencies needed to attain student success, purposeful assessment techniques and specific instructional intervention strategies. The data and feedback garnered from these school districts also clearly indicates the need for sustained and meaningful professional development for primary grade teachers, administrators and instructional support staff. This professional development needs to be scaffolded to ensure that Mississippi teachers acquire the knowledge and skills needed to provide effective instruction.

Finally, this data precluded the premise that students should be labeled according to their socio-economic background. Rather, the data clearly indicated that in six of the poorest and lowest performing school districts, students were capable of not only reaching grade level expectations but surpassing them. Even more importantly, the data proved that quality reading instruction in the K-3 years can prevent many reading difficulties from developing. Also, as the number of special education referrals decreased in the pilot school districts, came the knowledge that appropriate classroom instruction and support could prevent reading deficits. This point is evident in the National Reading Panel’s report which states, “excellent teaching is even more, not less, important for youngsters who are at risk in reading-and with this kind of teaching the majority of at-risk children can be successful.”

The MRRM is our state’s effort to fulfill our long-term commitment to fundamental changes in the reading instructional process implemented at the classroom level. Most importantly, the MRRM provides structure for the offering of consistent, statewide technical assistance and professional development thereby, increasing the connection between research, professional development, and instructional practice. Mississippi must continue to provide this blueprint for all stakeholders with an interest in ensuring that every child is taught by highly qualified teachers utilizing scientifically based assessments and programs of instruction.
Action Research Project: The Effect of Think-Aloud Strategies on Listening Comprehension Levels of K-1 Students

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Delta State University

Cheryl Cummins, Ed.D.
Delta State University

The joint position statement of the International Reading Association and the National Association for the Education of Young Children lists developmentally appropriate reading/writing practices for young children. In this statement, they have identified five phases children function at during the reading/writing continuum:

1. Awareness and exploration (goals for preschool)
2. Experimental reading and writing (goals for kindergarten)
3. Early reading and writing (goals for first grade)
4. Transitional reading and writing (goals for second grade)
5. Independent and productive reading and writing (goals for third grade)

In each of these phases, the International Reading Association and the National Association for the Education of Young Children list suggestions of what teachers can do to help guide children through the reading/writing continuum. K-3 examples are:

- Share books with children, including Big Books and model reading behaviors.
- Establish a literacy-rich environment.
- Encourage children to talk about reading and writing experiences.
- Frequently read interesting and conceptually rich stories to support the development of vocabulary by reading daily to children.
- Model strategies and provide practice for identifying unknown words.
- Read, write, and discuss a range of different text types (poems, informational books, fiction, non-fiction).
- Create a climate that fosters analytic, evaluative and reflective thinking.
- Ensure that children read a range of texts for a variety of purposes.
- Create a climate that engages all children as a community of literacy learners.

The goal of these phases is reading comprehension which is an internal act. Unfortunately, many children have difficulty with the language that is used in schools (Johns, Lenski, & Elish-Piper, 2002). Therefore, some children need assistance in linking their world to the school world. To assist in this transition, teachers utilize different strategies during the reading instruction time to help with the metacognition skills that are needed by children. One strategy, *Think–Aloud* (the explicit teacher modeling of the reading comprehension process) has been shown to significantly contribute to improved metacognitive skills for children. As the teacher reads, the teacher articulates his/her reading and reasoning strategies, including predictions that they would make, questions they would pose to themselves and inferences they would make about what they are reading. The students are asked to do the same (Leu & Kinzer, 2003). This reception of the thinking aloud process would help the children make connections to their own experiences, prior knowledge, or other texts with which they are familiar. The key is that it would help make reading personally meaningful and the school language more understandable.

During 2003-2004, the researchers conducted reading/writing best practice techniques in-service trainings for the K-1 Grenada Lower Elementary teachers in Grenada, Mississippi. Ten think-aloud strategies (Johns, Lenski, & Elish-Piper, 2002) were introduced to the teachers to be utilized with their K-1 students. In addition to providing technical assistance to in-service teachers, the researchers were also interested in measuring the effectiveness of the strategies by assessing gains in listening comprehension levels for the K-1 students. A pilot study was designed and the K-1 students were instructed for twenty weeks utilizing the think aloud strategies and assessed in the fall and the spring.

The purpose of the current study was to examine the impact of teacher-directed think-aloud-language development strategies on K-1 Grenada Lower Elementary School students. The twenty-week study measured achievement in listening comprehension levels of the K-1 students.
Method

Twenty-four Grenada Lower Elementary School teachers assessed 68 randomly selected K-1 students by administering Form A of the listening comprehension section of the Woods and Moe (7th edition) *Analytical Reading Inventory* as a pretest. The teachers then employed ten think-aloud strategies during daily whole class reading aloud times for twenty weeks. At the end of the twenty weeks, the teachers administered the equivalent Form B of the listening comprehension section of the Woods and Moe (7th edition) *Analytical Reading Inventory* to the 68 K-1 students.

Results

The results indicated a positive gain in reading level listening comprehension scores. The mean grade level achievement was two levels (s.d. = 1.159). Only ten percent (7 out of 68) of the tested students did not evidence a gain in reading levels. A possible reason for the success of the think-aloud strategies may be that the think-aloud strategies incorporated many of the best practices activities suggested by the International Reading Association and that these think-aloud strategies are, as reported, a positive influence on the language development of K-1 students.

Table 1.

<table>
<thead>
<tr>
<th>Number of Students</th>
<th>Reading - Level Gains</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+5</td>
<td>1.5</td>
</tr>
<tr>
<td>5</td>
<td>+4</td>
<td>7.4</td>
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<tr>
<td>15</td>
<td>+3</td>
<td>22.1</td>
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<td>27</td>
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<td>13</td>
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<td>19.1</td>
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<tr>
<td>6</td>
<td>0</td>
<td>8.8</td>
</tr>
<tr>
<td>1</td>
<td>-1</td>
<td>1.5</td>
</tr>
</tbody>
</table>

N=68
References


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*Reading is to the mind what exercise is to the body.*

- Joseph Addison

*No matter how busy you may think you are, you must find time for reading, or surrender yourself to self-chosen ignorance.*

- Confucius
Reading Comprehension: A Cognitive Perspective

Scott Alan Hutchens, Ph.D.
Delta State University

Reading involves both low-level automatic and strategic comprehension processes. During reading a reader accesses mental representations of the words in order to recognize each word in the text (Perfetti, 1985). This lexical access is an automatic process. The reader also represents the syntax level representation of the text. The syntactic representation is of the grammatical structural code of the text (Kintsch & Vipond, 1978). Comprehension involves propositional encoding and integration of the meaning of the text (Perfetti, 1985). The general account of processes in reading consists of lexical access, syntactic representation, and comprehension. Using these processes and representations, the reader builds a representation of the underlying meaning of the text.

In order to comprehend a text, a reader must create and maintain a representation of the ongoing text. The generally accepted view is that the underlying representation of meaning that is constructed by the reader is propositional. A proposition is composed of a predicate, or relational concept, and one or more arguments which are abstract concepts or propositions themselves (Kintsch & van Dijk, 1978; Kintsch & Vipond, 1978). Propositional representations are integrated within a network of propositions containing the meaning derived from the text. That is, a propositional representation is the underlying meaning of the text which reflects the situation described by the text (Kintsch & van Dijk, 1978; Kintsch & Vipond, 1978). For example, two sentences with different surface structure, such as “The car hit the sign” or “The sign was hit by a car” can be represented propositionally as (HIT, SIGN, CAR). In this proposition, the predicate is HIT; SIGN is an argument in the semantic role of an object; and CAR is a second argument in the semantic role of an instrument.

The reader’s prior knowledge is also involved in understanding a text. Thus, the knowledge that the reader brings into the reading situation affects comprehension. When reading a difficult text, as compared to a simple text, the reader may not have sufficient prior knowledge about the topic in order to fully comprehend the text. In this case, the reader may have to use strategic comprehension processes in order to understand the difficult text. That is, “increased textual demands mean the reader must make more and
more use of higher level comprehension processes” (Perfetti, 1985, p. 10). However, cognitive models differ in regard to the type of processing (i.e., low-level automatic or high-level strategic process) that is commonly used when reading text (e.g., Graesser, Singer, & Trabasso, 1994; Kintsch, 1988; Hutchens & Albrecht, 2005; Hutchens & Taraban, 2005, McKoon, Gerrig, & Greene, 1996; McKoon & Ratcliff, 1992; O’Brien & Albrecht, 1992; Singer, Graesser, & Trabasso, 1994).

There are two general constraints on whether a person will rely on high-level strategic processing or on automatic low-level activation. One constraint relates to the human cognitive system. The human cognitive system is a limited-capacity processor (Engle, 1996; Just & Carpenter, 1992). That is, one can only process a limited amount of information at a time. For example, research has demonstrated that individuals who are less efficient language processors have less working memory capacity and as a result experience a functionally smaller working memory capacity (Just & Carpenter, 1992). According to Just and Carpenter’s (1992) capacity-constrained comprehension model, individuals differ in the total amount of activation they have available in working memory to manage the demands of storage and computation during text comprehension. As a result, individuals with less activation are less capable of holding relevant information (i.e., representational elements) in working memory for extended periods of time, which results in poor comprehension of the text. Furthermore, according to Engle’s (1996) inhibition-resource hypothesis, limited attentional resources also cause the human cognitive system to be a limited-capacity processor. Attention resources are necessary for the inhibition of distracting thoughts and events which are incompatible with the goals of the current task (Engle, 1996). Engle states that individuals may differ in skill because less skilled individuals have fewer attention resources which prevent them from engaging in more strategic processing which is important to higher level language comprehension (1996). The inherent limitations of the human cognitive system could limit the extent to which a person could afford to apply high-level comprehension strategies.

A second constraint on comprehension processing relates to the text itself. Information that a person is currently processing is active and can be thought of as being foregrounded (in working memory). Information that was processed earlier but is no longer active can be thought of as being backgrounded (in long-term memory). For example, when reading a text, information in the beginning of the text is backgrounded...
when it is followed by unrelated information. From a processing perspective, information in a propositional representation may be activated (when foreground) or reactivated (when backgrounded) when related propositions are read in a text (e.g., Dell, McKoon, & Ratcliff, 1983; McKoon & Ratcliff, 1980; O’Brien, 1987; O’Brien, Plewes, & Albrecht, 1990). Thus, the characteristics of the text could make reading easier or more difficult for a reader.

Accessing needed information when reading allows us to construct an accurate memory representation which is important in maintaining local and global coherence. There has been a considerable debate concerning the process by which backgrounded information or information in long-term memory is accessed and reactivated (e.g., Graesser et al., 1994; Hutchens & Albrecht, 2005; Hutchens & Taraban, 2005; Kintsch, 1988; McKoon & Ratcliff, 1992; 1995; McKoon et al., 1996; O’Brien & Albrecht, 1992; Singer et al., 1994). Consistent with a minimalist view, low-level reactivation (Kintsch, 1988; McKoon et al., 1996; O’Brien & Albrecht, 1992) is one way in which individuals may gain access to backgrounded information that is needed. This type of access depends on processes of automatic spreading of activation. There are also several other ways to gain access to backgrounded information. One is through a problem-solving process of search-after-meaning (Graesser et al., 1994; Singer et al., 1994). In this constructionist view, individuals notice text characteristics (e.g., a goal was set) and constantly attempt to maintain a coherent, plausible representation of the ongoing text.

Minimalist models which emphasize the role of a low-level priming (i.e., resonance) process that (re)activates information describe comprehension as a two phase process (e.g., Kintsch, 1988; McKoon et al., 1996). First, in the construction or (re)activation phase, information currently in focus and information from incoming text elements serve as a retrieval cue to reactivate potentially relevant information from long-term memory. Second, in the integration phase, the new information is integrated with the activated portion of the discourse model. Central to the construction-integration view of text comprehension is that “…each new piece of linguistic information is understood in terms of the information that it evokes from memory” (McKoon et al., 1996, p. 919). Thus, the construction-integration representation develops from an interaction and fusion between the to-be-comprehended text and the general knowledge that the reader brings to the comprehension situation. Consistent with the minimalist
hypothesis (McKoon & Ratcliff, 1992; 1995), in the absence of strategic comprehension processing, it is assumed that readers access backgrounded information only when it is necessary to maintain local coherence, or when the information is “quickly and easily available” (McKoon & Ratcliff, 1992, p. 440) from long-term memory. Following global memory models (e.g., Hintzman, 1986; Ratcliff, 1978), relevant information in long-term memory is made quickly and easily available via a resonance process. The resonance process is a core assumption of the minimalist view. The resonance process is a continual low level (re)activation process which allows backgrounded or distant information to be easily, quickly, and passively reactivated through overlapping memory traces (e.g., argument overlap) (O’Brien, 1995). That is, when the contents of active memory change, the resonating information in inactive memory also changes. It is assumed that propositions and concepts in the memory representation are activated in proportion to their relatedness to propositions and concepts derived from the currently read text. Propositions and concepts in memory resonate to the input as a function of their strength and the degree of match to the input from reading the text. The match of memory to input elements depends on previously established associations, overlapping features of concepts, and overlapping arguments of propositions (Albrecht & Myers, 1995; Hutchens & Albrecht, 2005; Hutchens & Taraban, 2005). This resonance process continues until the activation stabilizes and the most activated elements enter working memory where the reader attempts to integrate them with the current read information. This low-level construction – integration process can be simulated mathematically.

Mathematical Simulation of Reading Comprehension.

In the construction phase, an associative activation process takes place. Kintsch (1988) explains that each proposition or concept that has been formed serves as a cue for the retrieval of associated propositions and concepts in the memory representation. Let $S(i,j)$ be the associative strength between nodes $i$ and $j$; let $S(i,h)$ be the associative strength between $i$ and some node $h$. If node $i$, in the knowledge net is positively associated with $n$ other nodes in the net, then the probability that the retrieval cue $I$ will retrieve node $j$ is:

$$P(j|I) = \frac{S(i,j)}{\sum_{h=1}^{n} S(i,h)}.$$
From the text-based and knowledge-based construction phase, a set of \( n+m \) elements is obtained, in which \( n \) elements are elements derived from the text and \( m \) elements are knowledge propositions from long-term memory that have been selected through the associative activation process described above (Kintsch & Welsch, 1991). In the integration phase, the \( n+m \) elements are linked together, based on relationships among the elements, to form a network. Thus a coherence matrix (matrix \( C \)) of \( n+m \) elements can be developed, where the element \( c_{ij} \) determines the link strength between elements \( i \) and \( j \) (Kintsch & Welsch, 1991). In an activation vector, a row vector \( A_1 \) specifies an activation value \( a_i \) for each of the \( n+m \) elements (Kintsch & Welsch, 1991). In the beginning, the \( n \) elements developed from the text have an activation strength of \( 1/n \) and the \( m \) elements selected from long-term memory have an activation value of 0, so that \( \sum a_i = 1 \). Kintsch and Welsch explain that activation spreads in this network by “taking the products \( A_1*C = A_2, A_2*C = A_3, \ldots, Ak-1*C = Ak \), or \( A_1*(C)k = A \), where the vector \( A_1 \) is renormalized after each multiplication with \( C \) so that \( \sum a_i = 1 \), and \( k \) is selected so that the change in mean activation value after a multiplication is less than some criterion value” (Kintsch & Welsch, 1991, p. 371). The final activation vector \( A \) reflects how strongly each element, from the text or long-term memory, that was constructed during the construction phase is activated after comprehension (Kintsch & Welsch, 1991). In this integration phase, related elements strengthen each other, while unrelated or irrelevant elements have a 0 or negative activation value.

After comprehension, this coherence matrix, which specifies the activation values and interrelationships among \( n+m \) elements, can be represented in a new matrix. The memory strength matrix (matrix \( M \)) is the long-term memory representation that the construction-integration phase develops. Kintsch and Welsch (1991) define “the memory strength matrix of size \( (p+q)(p+q) \), with elements \( m_{ij} \), such that:

\[
m_{ij} = c_{ij}a_i a_j,
\]

where \( p+q \) is the number of elements in \( A \) with positive activation values \( (p \leq n, q \leq m) \), \( c_{ij} \) is an element of \( C \), and \( a_i \) is the final activation value of the \( i \)th element” (p. 373). In this representation, the unrelated or irrelevant elements (i.e., elements with a 0 or negative activation value) that were generated in the construction phase have been eliminated; only the related elements remain (Kintsch & Welsch, 1991).
In Table 1, two simple texts were transformed into propositional representations in order to demonstrate low-level reactivation based on argument overlap (see Figure 1 for a propositional network representation of the texts). Unlike Example Text 1, the argument overlap in Example Text 2 is separated by an intervening sentence. Propositions were assigned values based on their associative strength (i.e., for simplicity, .80 was assigned for argument overlap and .01 was assigned for no argument overlap). Following Kintsch and Welsch (1991), the proposition associative strengths or weights were placed in a coherence matrix (i.e., matrix C) which was multiplied by an activation vector. The activation vector consisted of the sentence that was currently being read and the most active previous proposition. The product of the matrix multiplication was rescaled by dividing the values in the activation vector by the sum of their values. The coherence matrix was then multiplied by the rescaled activation vector \( A_i \). This multiplication process continued until asymptote was reached, using the criterion that there was an average change of .00001 or less in the activation of the previous rescaled vector and the current vector (i.e., the activation stabilized). At the end of each processing cycle (i.e., integration stage), the final rescaled activation vector modified the coherence matrix in order to construct a long-term memory representation of the text (i.e., matrix \( M \)). This modification process strengthened related propositions and weakened unrelated propositions. Finally, the association strengths of the propositions in the next sentence were added to the modified matrix and another processing cycle was started.

Table 1

<table>
<thead>
<tr>
<th>Example Text 1</th>
<th>Example Text 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holly was ready to cook.</td>
<td>Holly was ready to cook.</td>
</tr>
<tr>
<td>John cleaned the house.</td>
<td>John cleaned the house.</td>
</tr>
<tr>
<td>John painted the house.</td>
<td>Holly cooked dinner.</td>
</tr>
</tbody>
</table>

Propositional Representation

<table>
<thead>
<tr>
<th>P1</th>
<th>READY (HOLLY,P2)</th>
<th>P1</th>
<th>READY (HOLLY,P2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P2</td>
<td>COOK (HOLLY)</td>
<td>P2</td>
<td>COOK (HOLLY)</td>
</tr>
<tr>
<td>P3</td>
<td>CLEAN (JOHN, HOUSE)</td>
<td>P3</td>
<td>CLEAN (JOHN, HOUSE)</td>
</tr>
<tr>
<td>P4</td>
<td>PAINT (JOHN, HOUSE)</td>
<td>P4</td>
<td>COOK (HOLLY, DINNER)</td>
</tr>
</tbody>
</table>
Figure 1. Propositional network representations of example Texts 1 and 2. Connections designate the associated neighboring propositions and argument overlap. Notice that the propositional network of Example Text 2 is more interconnected.

Example Text 1
Holly was ready to cook.
P1  READY (HOLLY,P2)
P2  COOK (HOLLY)

Coherence Matrix

\[
\begin{bmatrix}
1 & 1 \\
0.80 & 1
\end{bmatrix}
\]

P1  P2

\[
\begin{bmatrix}
0.500000 & 0.500000
\end{bmatrix}
\]

After 3 Cycles

Example Text 2

P1  P2

\[
\begin{bmatrix}
0.500000 & 0.500000
\end{bmatrix}
\]
Long-Term Memory Matrix

\[ m_{ij} = c_{ij}a_i a_j \]

<table>
<thead>
<tr>
<th></th>
<th>P1</th>
<th>P2</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>.25</td>
<td>.20</td>
</tr>
<tr>
<td>P2</td>
<td>.20</td>
<td>.25</td>
</tr>
</tbody>
</table>

John cleaned the house.

P3  CLEAN (JOHN,HOUSE)

Coherence Matrix

\[
\begin{bmatrix}
.5 & .5 & 1 \\
.25 & .20 & .01 \\
.20 & .25 & .01 \\
.01 & .01 & 1 \\
\end{bmatrix}
\]

= Rescaled Vector  
\[
\begin{bmatrix}
.158784 & .158784 & .682432 \\
.017536 & .017536 & .964929 \\
\end{bmatrix}
\]

After 15 Cycles

Long-Term Memory Matrix

\[ m_{ij} = c_{ij}a_i a_j \]

<table>
<thead>
<tr>
<th></th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>.000077</td>
<td>.000061</td>
<td>.000169</td>
</tr>
<tr>
<td>P2</td>
<td>.000061</td>
<td>.000077</td>
<td>.000169</td>
</tr>
<tr>
<td>P3</td>
<td>.000169</td>
<td>.000169</td>
<td>.931088</td>
</tr>
</tbody>
</table>

John painted the house.

P4  PAINT (JOHN,HOUSE)

Coherence Matrix

\[
\begin{bmatrix}
.017536 & .017536 & .964929 & 1 \\
.000077 & .000061 & .000169 & .01 \\
.000061 & .000077 & .000169 & .01 \\
.000169 & .000169 & .931088 & .80 \\
.01 & .01 & .80 & 1 \\
\end{bmatrix}
\]
Note, in the above rescaled vector, the activation values of the unrelated propositions (i.e., P1 and P2) were low (i.e., .002922) because they did not share arguments with P3 and P4.

### Long-Term Memory Matrix

\[ m_{ij} = c_{ij} \cdot a_i \cdot a_j \]

<table>
<thead>
<tr>
<th></th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>P4</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>.000000000066</td>
<td>.000000000052</td>
<td>.000000024</td>
<td>.00000148</td>
</tr>
<tr>
<td>P2</td>
<td>.000000000052</td>
<td>.000000000066</td>
<td>.000000024</td>
<td>.00000148</td>
</tr>
<tr>
<td>P3</td>
<td>.000000024</td>
<td>.000000024</td>
<td>.2202464</td>
<td>.1975779</td>
</tr>
<tr>
<td>P4</td>
<td>.0000148</td>
<td>.0000148</td>
<td>.1975779</td>
<td>.2578568</td>
</tr>
</tbody>
</table>

### Example Text 2

Holly cooked dinner.

P4 \text{ COOK (HOLLY,DINNER)}

### Coherence Matrix

\[
\begin{bmatrix}
0.017536 & 0.017536 & 0.964929 & 1
\end{bmatrix}
\]

<table>
<thead>
<tr>
<th></th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>P4</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>.000077</td>
<td>.000061</td>
<td>.000169</td>
<td>.80</td>
</tr>
<tr>
<td>P2</td>
<td>.000061</td>
<td>.000077</td>
<td>.000169</td>
<td>.80</td>
</tr>
<tr>
<td>P3</td>
<td>.000169</td>
<td>.000169</td>
<td>.931088</td>
<td>.01</td>
</tr>
<tr>
<td>P4</td>
<td>.80</td>
<td>.80</td>
<td>.01</td>
<td>1</td>
</tr>
</tbody>
</table>

Note, in the above rescaled vector, since P4 shared arguments with P1 and P2, the activation values of P1 and P2 increased (i.e., 238179 as compared to .002922 in Text.
1). Also, the activation values of the unrelated proposition (i.e., P3) was low (i.e., .006521) because it did not share arguments with P1, P2, and P4.

**Long-Term Memory Matrix**

\[ m_{ij} = c_{ij}a_i a_j \]

<table>
<thead>
<tr>
<th></th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>P4</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>.000004368</td>
<td>.00000346</td>
<td>.000000262</td>
<td>.09853408</td>
</tr>
<tr>
<td>P2</td>
<td>.00000346</td>
<td>.000004368</td>
<td>.000000262</td>
<td>.09853408</td>
</tr>
<tr>
<td>P3</td>
<td>.000000262</td>
<td>.000000262</td>
<td>.000039593</td>
<td>.000033721</td>
</tr>
<tr>
<td>P4</td>
<td>.09853408</td>
<td>.09853408</td>
<td>.000033721</td>
<td>.267415162</td>
</tr>
</tbody>
</table>

**Comprehension Strategies**

The minimalist view states that “readers do have specific goals, especially when learning new information from texts, and so they often engage in strategic processes designed to achieve those goals” (McKoon & Ratcliff, 1992, p. 440). For example, when a researcher reads a research article or a student reads a textbook, the reader may have special goals or strategies which allow him or her to construct more complex representations of the information described in the text than when he or she reads a popular magazine or newspaper article. Thus, the likelihood that backgrounded information is accessed may increase. Furthermore, as Perfetti (1985) noted, when a text becomes more difficult, higher-level comprehension processes are utilized. Thus, readers may maintain coherence when reading through the use of high-level, deliberate comprehension strategies (Pressley, Brown, El-Dinary, & Afflerbach, 1995; Pressley, Wood, Woloshyn, Martin, King, & Menke, 1992). Also, skilled readers form multiple strategies, instead of single strategies (Pressley et al., 1995). These strategies include the following:

- Predicting upcoming content in text; making associations to the content of readings on the basis of prior knowledge; constructing images representing the meaning of the text; asking questions when uncertain about a text’s meaning; seeking clarifications until meaning is determined; summarizing, and using problem-solving strategies when dealing with unfamiliar words, for example,
decoding, analyzing context clues, rereading, skipping an unknown word, and reading on. (Pressley et al., 1995, p. 220)

As the characteristics of the text change, some strategies may be more appropriate to use than other strategies. In order to comprehend text effectively, a reader must become engaged in the text, use prior knowledge often, and be reflective and mindful during reading (Pressley et al., 1995). The description of a skilled reader in Pressley et al. (1995) may not accurately describe a typical college-level reader. However, it is likely that college readers do have knowledge of some of these strategies and could apply them toward understanding difficult text. If not, instructors should provide students with reading comprehension strategies (e.g., questions) in order to encourage students to engage in high-level comprehension strategies. Otherwise, students may read a textbook in a minimalist manner as if they are reading a magazine.

Interestingly, Hutchens and Taraban (2005) demonstrated that college students are capable of adjusting their reading comprehension strategies according to the requirements of the reading situation. That is, the readers processed the same text differently according to the type of question that they anticipated they would be required to answer. Consistent with the minimalist view, readers relied more on low-level reactivation processes based on overlapping memory traces to reactivate backgrounded information in simple question conditions. However, consistent with the constructionist view, readers relied more on high-level problem-solving process of search-after-meaning to gain access to backgrounded information in event-sequence question conditions. It is important to note that even though the texts were simple (i.e., 8.8 grade-level) and the event-sequence and detail questions were both rated as being fairly easy, the readers read the texts differently in order to answer the questions correctly. Hutchens and Taraban (2005) demonstrated that explicit comprehension strategies may be invoked simply by subtly changing the context of the reading situation through questioning. This finding is important because it demonstrates how sensitive readers are to the text and reading situations.

Furthermore, the findings of Hutchens and Taraban (2005) indicate that both types of reading processes (i.e., minimalist and constructionist) may be recruited in different reading situations. Purposes external to the text may induce the reader to process
a text in a minimalist manner or a constructionist manner. The subtle strategy manipulation used in Hutchens and Taraban (2005) was helpful in gaining insight to when passive or strategic processes are recruited. It makes sense that we may use explicit comprehension strategies using minimal effort (i.e., minimalist) and rely upon the author of the text to explicitly direct us to the subsequent discourse topics when reading a simple story or magazine. Conversely, it also makes sense that we may process a text in a problem-solving manner and search for explanations (i.e., constructionist) when reading texts with an explicit comprehension goal in mind, such as reading a textbook to prepare for an exam, or reading an instruction manual or user guide in order to understand how to assemble a device or learn how to use a computer program.

One cannot begin to imagine the endless number of different texts and reading situations that we encounter in our lives, as children, teenagers, and adults. Information gathered from studies such as Hutchens and Taraban (2005) will be beneficial in improving the procedures and techniques in which information is conveyed and the comprehension strategies that individuals develop and use to read and understand texts in different reading situations.

References


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*The reading of all good books is like a conversation with the finest minds of past centuries.*

- Rene Descartes

*We shouldn't teach great books; we should teach a love of reading.*

- B. F. Skinner

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Editor’s note

*Delta Education Journal* is published by Delta State University, College of Education, in the fall and spring each year. We invite manuscripts that promote teaching and learning. Submissions should follow APA style. For the fall issue, please submit a MS Word file on disk or as an email attachment to the address below by October 1, and for the spring issue, by March 1.

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