Effective Strategies for Activating Students’ Background Knowledge in Reading Comprehension

Chioma O.C. Chukueggu and Nneka P. Umera-Okeke

Abstract
People previously think that any reader can comprehend a text once the vocabulary and grammar are not beyond his reach. This is not so! Readers level of mastery in text comprehension can be as a result of many factors, chief among which is acquisition of prior knowledge regarding the text. Put in other words, comprehension of a reading text involves extracting information from the written message and the reader s schemata and matching them together. A schema can involve any of the types of knowledge you just learned about or combinations of them that aids in the understanding of a future lesson. Studies have it readers problems with reading comprehension can be attributed to the readers’ poor background knowledge or schemata which leads to not being able to fill in the missing gaps. If background knowledge aids reading comprehension, how can the teacher integrate it as a strategy for successful reading comprehension? This paper examines the schema theory as the theoretical framework for background knowledge. It also described different ways of activating / building background knowledge. This is because learners with prior knowledge of the text under study construct meaning from text with less effort than readers with weak prior knowledge. Some ways of activating background knowledge discussed in this paper include Mathew’s effect, brainstorming class discussions, pre-question, visual aids, advanced organizers.

Introduction
Students are constantly confronted with new information, particularly once they progress to the upper elementary schools and secondary schools when they transit from learning to read to reading to learn (Chall, 1983). To read to learn effectively, students need to integrate new materials into their existing knowledge base, construct new understanding, and adapt existing conceptions and beliefs as needed. Proficiency at these tasks is essential to literacy (Davis & Winek, 1989; Squire, 1983; Weisberg, 1988). However, students who lack sufficient background knowledge or are unable to activate this knowledge may struggle to access, participate, and progress throughout the general curriculum, where reading to learn is a prerequisite for success.

Again, text comprehension is a complex cognitive skill in which the reader should construct meaning by using all the available resources from both the text and previous knowledge. These resources assist readers in utilizing lexis and syntax, retrieving their meanings from ones mental lexicon, making inferences, and employing schemata. The correct implementation of these resources can help readers in the successful comprehension of the text (Fukkink R.G., Hulstijn, J &| Simis, A. 2005).

Background Knowledge
The terms “background knowledge” and “prior knowledge” are generally used interchangeably. For example, Stevens (1980) defines background knowledge quite simply as . . .what one already knows about a subject. . . (p.151). Biemans and Simons (1996) definition of background knowledge is slightly more complex, ... background knowledge is all knowledge learners have when entering a learning environment that is potentially relevant for acquiring new knowledge (p.6). Prior knowledge is therefore the whole of a persons knowledge, including explicit and tacit knowledge, metacognitive and conceptual knowledge.

Prior knowledge and background knowledge are themselves broad terms for many more specific knowledge dimensions such as conceptual knowledge and metacognitive knowledge. Subject matter knowledge, strategy knowledge, personal knowledge, and self-knowledge are all specialized forms of prior knowledge/background knowledge. The research studies selected and reviewed for this article targeted the parent concepts prior knowledge/background knowledge for study, and in discussing these studies and throughout the remainder of this article, these two terms are used interchangeably. The diagram below illustrates what background knowledge embodies.
According to Lipson (1982) at the time of recall, students use what they know about the information. In order to connect, readers must use prior knowledge along with data given and information inferred from within the text. A reader who brings prior knowledge can make inferences required to construct meaning from the text with less effort than a reader with a weak prior knowledge.

**Reading Comprehension and Reading Fluency**

This is a process of constructing meaning from written text based on a complex coordination of a number of interrelated sources of information. According to National Reading Panel (2000), fluency is the ability to read a text quickly, accurately and with proper expression (p.31). Allinder, Dunse and Brunken (2001) defined reading fluency as the ability to read orally in a smooth and effortless manner. Several studies done on the relationship between fluency and prior knowledge show that large differences existing in reading times depended upon whether the topics were familiar (Zakaluk, Samuels & Taylor, 1986). Feldman (2002) states that:

If you’re reading slowly and struggling with individual words, sound them out, even if you’re sounding them correctly, all of your mental attention is wrapped up in the actual decoding. So you’re not paying attention to the point of reading, which is obviously the meaning. We find out that fluency and automaticity are very big deal (p. 1)

On the other hand, when fluent readers read silently, they recognize words automatically; they group words quickly in ways that help them gain meaning. Fluent readers read aloud effortlessly and with expression. Their reading sounds natural as if they are speaking. They are able to do this because of the background knowledge they possess.

Anderson and Pearson (1984) explained that prior knowledge affects comprehension in three ways;

1) It helps students make inferences about their reading;
2) It directs attention to info that is important in a knowledge domain and
3) It provides a plan for recall

Students who lack prior knowledge are going to have a difficult time through school careers. Students with high prior knowledge will recall information in a more coherent manner will make more knowledge based
inferences and will have an idea of which ideas in a text are important and which are not (Stahl et al, 1991). Taft and Leslie (1985) stressed that children should not be expected to comprehend materials where the major concepts therein are unknown even when the concepts are explicitly defined in the text (p.177). Even with adequate comprehension based on prior knowledge, fluency may turn any school or recreational reading assignment into a marathon of frustration for any student.

**Theoretical Framework**

**Schema Theory**

A schema is organized knowledge of the world which helps to account for the relationships among elements. Schemata are the plural of schema. While schema refers to a particular organizational pattern, schemata are a network of many schema. Schema is the cognitive constructs which allow for the organization of information in long-term memory and according to Cook (1989) the mind stimulated by key words or phrases in the text or by context, activates a knowledge of schema (p. 69). This covers the knowledge of the world, from everyday knowledge to very specialized knowledge, knowledge of language structures and knowledge of texts and forms they take in terms of genre and organization. In addition to allowing us to organize information economically, schemas also allow us to predict the continuation of both spoken and written discourse. A student trying to read the biography of General Ikemba Ojukwu would be greatly assisted by Nigeria Civil War schema; i.e., specific facts, ideas and concepts about that part of history woven into a framework within which to process the new information encountered. Without it, he/she may not understand everything in the text.

Schema theory is based on the belief that every act of comprehension involves ones knowledge of the world as well (Anderson et al in Carrell and Eisterhold, 1983, p.73). Thus, readers develop a coherent interpretation of text through the interactive process of combining textual information with the information a reader brings to a text.

All readers carry different schemata (background information) and these are also often culture-specific. Swaffer (1988), mentions that schema knowledge can be more influential in reading comprehension than word knowledge and she claims that topic familiarity facilitates language recognition, recall of concepts, and inferential reasoning (p.126). Brantmeier (2003) added that topic familiarity can be an exceedingly significant factor in affecting L2 comprehension as it enhances the reconstruction of the main idea. In other words, comprehension of a reading text involves extracting information from the written message and the readers schemata and matching them together. In the same line, Bransford et al, (1986) found that problems in reading comprehension can be attributed to the readers not having the required background knowledge or schemata which leads to not being able to fill in the missing gaps.

Reading problems in L2 is caused by activating the wrong schemata rather than not activating any schemata at all. Bügel and Buunk (1996) also claim that schema theory can explain why text context can influence the sexes in giving different responses to different reading comprehension questions. Their justification is that since males and females have different interests, they read different topics which eventually results in having different schemata. Brantmeier (2004) contends that gender is an important element affecting schemata in the process of meaning making from the text. She therefore emphasizes the need to carry out more studies on gender and text topic.

**Strategies for Activating Background Knowledge**

Spires et al (1998) noted that prior knowledge activation was stimulated not simply by domain-specific knowledge but by the combination of personal and domain-specific knowledge. By personal domain, they meant the informal knowledge that is picked along the way. Specific domain knowledge is knowledge that is specific to the topic and usually received formally. Activating prior knowledge, or schema, is the first of other strategies that are keys for reading comprehension success. These strategies, identified through research based on what good readers do when they are reading, help students become metacognitive. They learn to think about their thinking as they are reading. To activate prior knowledge, the following strategies could be adopted by the language teacher:

**1. Direct Instruction**

Direct instruction on background knowledge can significantly improve students comprehension of relevant reading material (Dole, Valencia, Greer, & Wardrop, 1991; Graves, Cooke, & Laberge, 1983). For example,
in one study, students who received direct instruction on relevant background knowledge before reading an expository text demonstrated significantly greater reading comprehension than peers who received direct instruction on an irrelevant topic area (Stevens, 1982). Dole et al., (1991) extended these findings, showing that teaching students important background ideas for an expository or narrative text led to significantly greater performance on comprehension questions than did no pre-reading background knowledge instruction. By building students background knowledge teachers might also help to counteract the detrimental effects that incoherent or poorly organized texts have on comprehension (McKeown et al., 1992).

Direct instruction on background knowledge can be embedded into an approach such as previewing, where students are presented with introductory material before they read specific texts. Such introductory material may include important background information such as definitions of difficult vocabulary, translations of foreign phrases, and explanations of difficult concepts. For example, in a study by Graves et al., (1983), students were given previews of narrative texts that included a plot synopsis, descriptive list of characters, and definitions of difficult words in the story. Thus, students were given both a framework for understanding the stories and important background information. Students not only liked the previews but made significant improvements in both story comprehension and recall.

By building students background knowledge, teachers may also be able to indirectly influence other aspects of academic performance such as writing. For example, Davis & Winek (1989) found that students felt better prepared to write a research paper when they took part beforehand in an extended course of building background knowledge through individual research and in-class sharing and discussion. While this study does not show any direct impact on writing quality, it might be expected that improving students sense of preparedness might raise their engagement and/or motivation, translating into better performance.

2. Use of Advanced Graphic Organizers

Advance organizers are specific types of cognitive organizers. They are a means of helping students relate the new reading material to something they already know. If material can be related to the learners background and experiences, it can be meaningful. When these organizers are skillfully prepared, these help to activate knowledge students possess while at the same time helping them to see it in relation to the material they are about to read. As students are activating their prior knowledge and making connections, they use graphic organizers, such as a concept map, a flow chart, or a K-W-L chart, to help map their thinking. Often students keep reflection or response journals where they record thoughts, feelings, insights, and questions about what they read. Students, in large and small groups, discuss and write about the connections they are making to texts. Here are some examples of the organizers:

(a) The K-W-L Chart for Non-Fiction Reading

![K-W-L Chart](image)

The K-W-L Chart is a great way to access background knowledge and to track new learning. When reading about a new topic, brainstorm a list of what you already know about the topic. Then brainstorm a list of what you believe you want to learn about the topic. After reading, brainstorm a list of what you learned that has added to your background knowledge for future reading.

(b) Concept mapping

Another kind of graphic organizer is concept mapping which shows relationships among concepts. This hierarchical arrangement depicts the concepts, as well as examples, by circling the concepts and linking related concepts with connecting: lines. Words or phrases to explain how the relationships should be written on each connecting line.
This concept mapping can help students to:
• identify concepts related to the main idea
• visualize how ideas are connected
• understand relationships
• organize knowledge
• improve comprehension and problem solving skills

(c) Webbing

Webbing is a graphic organizer that presents a visual, web like picture of a concept or topic and related words or phrase. The main topic or idea is shown at the center of the web with spokes containing the related ideas stemming from this circle.

This webbing organizer can help students to:
• plan writing strategies
• study for a test
• identify patterns of information
• visually recall connections
• share prior knowledge

(d) Flowchart

A Flow chart is a visual representation where graphics are used to show sequence. The flow of events, actions, or ideas is depicted by using various shapes or pictures connected by arrows moving in the intended direction.

This chart can help students to:
• develop logical and sequential thinking
• plan for an event
• focus on connections
• develop organizational skills
• explore multiple solutions

3. Brainstorming:
A learner who indulges in organizing graphically is brainstorming. It has been discovered that one of the simplest methods for helping students activate background knowledge is to prompt them to bring to mind and state, write down, or otherwise record what they know. Asking students to answer a simple question such as What do I already know about this topic orally or on paper is a straightforward way to do this. Activating relevant prior knowledge by expressing in some form what one already knows about a topic has been demonstrated to be more effective than activating irrelevant background knowledge (Peeck et al., 1982) or not activating any background knowledge (Carr et al., 1996; Smith et al., 1983; Spires et al., 1998) at improving text recall and/or comprehension. And Spires & Donley (1998) found that activating background knowledge through reflection and oral elaboration during text reading was a more effective strategy than taking notes on main ideas and their corresponding details. In these sessions, teachers ask students to examine together the title of the selection they are about to read. The teacher lists on the board all the information that come to mind as students read the title. These pieces of information are then used to further recall, and in the process considerable knowledge will be activated.

4. Semantic Mapping:
Students still use brainstorming strategies in semantic mapping; however this strategy is organized and controlled by the teacher. As students offer their personal ideas about a topic, the teacher writes these ideas on the board. In brainstorming, all ideas are written on the board. In semantic mapping, ideas are organized on the board under headings. The diagram represents the information elicited from the students but created in such a way that qualities and relationships are evident. During active reading, students may also use semantic maps. As they read, they include new information on their maps. During post reading, students can use their maps as a review of information gained.

5. The Matthew Effects
The vocabulary knowledge of a beginning reader develops long before a child enters school. During the preschool years, children develop vocabularies orally by listening and speaking. Homes or preschool environments that provide rich and extensive language experiences help children to enter school ready to learn to read. These children not only understand the meaning of the words they read but also use the meaning of words to figure out unknown words. They get an early start in reading and become good readers. Meanwhile, their peers who have less developed vocabularies struggle to learn how to read. This situation can be likened to Matthews effect. The rich get richer and the poor get poorer. We see it in our lives everyday. But what does that have to do with reading? Good readers become better readers and poor readers become poorer readers.

The question is, Do poor readers really become poorer readers? Yes, when compared to their peers on standardized tests, poor readers fall further and further behind as the years pass. Some researchers such as (Stanovich, 1986) coined the term Matthew effects to represent this theory. The term was based on a passage in the Bible from the Gospel according to Matthew: For unto every one that hath shall be given, and he shall have abundance: but from him that hath not shall be taken away even that which he hath (Matthew 25:29).

The Matthew effects work a bit like snowballs. The more one reads, the more one rolls around in the snow, collecting new vocabulary which in turn increases reading comprehension and understanding. Poor readers simply don’t roll around and collect new vocabulary at the same pace as good readers, and so don’t grow as quickly in their reading comprehension and understanding. Therefore, their achievement falls further below expectation for their age or grade level each succeeding year.

Teachers can strive to help children avoid the long-term negative consequences of poor reading in several ways. Teachers can help children develop deep and rich vocabularies before they begin to read. They can provide direct and systematic instruction in phonological awareness as a prerequisite to reading instruction so the children can have early success with phonics or other code-breaking instruction. They can teach efficient mechanisms of word identification (phonics, sight vocabulary, etc.) as soon as possible so students can read independently and increase the possibility of developing deeper and richer vocabularies through reading. Wide reading is important in providing students with information about people, places, events and situations. Even though direct experience is preferred, many times it is not possible. However, experiences lived vicariously through reading can produce tremendous results.

Teachers need to look for ways to increase the amount of exposure to vocabulary and reading content without requiring the students to be totally reliant on reading the words. Allowing students to listen to tape-recorded text and asking peers to read to the student are common ways to address the problem. While rewriting text is an option for helping poor readers learn content, to do so may eliminate the very vocabulary the students needs to learn to reverse the Matthew effects.

6. Class Discussions:
Class discussions and informal talks in and out of class all serve as techniques to discover more about what students bring to their reading. Over a period of time, teachers can begin to get some idea as to what their students know and can adjust how much time needs to be spent on background information.

7. Pre-questions:
Whenever teachers or students decided on questions to be answered by reading, they are activating prior knowledge. These questions tend to focus attention and provide for purposeful reading. Teachers can accomplish this by preparing questions in advance of reading. This will help in guiding students as they complete their reading assignment. The teacher can also help students develop their own questions which will help them establish purpose and focus attention. Question as to what they already know regarding the assigned selection. Expand on the terms and information they already understand. Elicit a large number of associations from the students to the prior knowledge they already possess and help them see the connections.
Visual Aids:
Pictures and other visual materials can activate a student’s prior knowledge. If a student has some schema for snakes, a simple picture may serve to retrieve appropriate knowledge. Thus a teacher may share this photograph of a snake before students read a science textbook chapter on snakes and other reptiles. The picture serves to activate the students schemata on snakes.

Real-Life Experiences:
In addition, actual experience is the best way to develop and refine the schemata that make up readers prior knowledge. To impact a students’ memory, they must see, touch, use, and experience real objects or situations. If possible, provide any real-life experiences that have to do with the assignment. Even something done on a small level will help with students understanding.

Conclusion
In this paper, we have viewed prior knowledge as some life experience, either real or vicarious, previous works read and experience with language which one must possess before one can grasp the subject matter of a text. The study has shown that activating schemata for reading comprehension effects on the reading comprehension of students and is inept to increasing reading fluency. This is because information that do not fit into schema may not be comprehended or could be comprehended incorrectly.

REFERENCES


