

Use of Schema Theory in the Teaching of Reading Comprehension

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Abstract

Reading ability is one of the most important skills a student should have. In traditional reading instruction, the emphasis is placed on breaking down sentences and words to grasp the meaning of a passage, which often renders students passive learners. This method greatly impedes the development of their communicative competence. The principles of schema theory reveal that readers rely on their pre-existing knowledge to make sense of texts, with comprehension emerging from the interaction between new information and the reader's mental schemas. Therefore, by introducing schema theory and its relationship with English reading, this essay discusses the practical application of schema theory in senior high school English reading teaching. Building on this foundation, the study explores ways to expand linguistic schemata, stimulate content schemata, and refine formal schemata. It proposes specific English reading instruction methods and strategies to help students effectively construct and activate schemata, thereby enhancing their reading proficiency.

Keywords

Schema theory; Reading comprehension; English reading teaching

1. Introduction

Reading is a vital component of English language acquisition and serves as a key channel for gaining knowledge and information. As a basic language skill, reading has attracts more and more attention from English learners. However, the traditional English reading teaching method believes that reading comprehension is a bottom-up passive decoding process, that is, to understand an article, we must first start from the phonemes, morphemes, words, then to the sentence and text. Only by understanding the text word by word, can we understand the whole article. For years, English learning has overemphasized rote memorization of vocabulary and grammar rules. Despite significant time and effort invested by both teachers and students, the outcomes remain disappointing. Traditional reading classes tend to prioritize grammatical and lexical knowledge while giving insufficient attention to

cultural context and structural patterns. A common issue persists where students, despite having strong grammar foundations, various reading techniques, and rich vocabulary, fail to comprehend texts effectively. The root cause lies in their over-emphasis on language forms at the expense of developing the contextual knowledge (schema) essential for comprehension.

Schema theory serves as a crucial and effective strategy in reading instruction. By integrating perspectives from cognitive psychology, pragmatics, information processing, and artificial intelligence, it offers fresh insights into the reading process. This approach holds significant value for understanding both the mechanisms and patterns of reading comprehension. Some linguists argued that readers' understanding of a text is formed through the interactive process of combining textual information with relevant past experiences of the reader. That is to say, if we do not have a corresponding schema in our mind, we cannot generate expectations about the text. Similar to the different classifications of memory, schema also have different classifications: from the perspective of reading comprehension, the schema can be divided into content schema, formal schema and linguistic schema.

In English reading teaching, the activation and construction of schema will greatly improve students' reading efficiency. Reading comprehension is not merely a passive decoding process, but rather an active and complex cognitive activity involving dynamic interaction between textual information and the reader's mind.

In this process, the reader's original knowledge structure schema is more important than the difficulty of the reading materials. In the process of reading, the schema has the functions of anticipation, selection and consolidation (Wei & Zhang, 2004). Thus, in foreign language reading instruction, it is crucial to build new schemata, activate existing ones, and reinforce and expand related knowledge frameworks. The development of psycholinguistics and applied linguistics has led to greater recognition of the important relationship between schema theory and second language learning.

2. Theoretical Basis

2.1 Schema theory

2.1.1 Definition of schema

The concept of schema was originally introduced by philosopher Immanuel Kant in 1781, who viewed it as a product of transcendental imagination. Later, psychologist Frederic Bartlett (1932) pioneered its application in psychological research. Bartlett proposed that human memory operates through schemas - cognitive frameworks that help individuals process, organize, and recall new information. Any learning process is carried out on the basis of schema. If learners do not have corresponding schema in their minds or can not properly activate and use these schema, they can not achieve the purpose of understanding. Rumelhart's (1977) development of schema theory presented schemata as the core cognitive units that support and enable all forms of information processing. Schema theory is a theory about how to ac-

tivate existing knowledge and how to apply these knowledge. Widdowson (1983) defines schema as a systematic cognitive framework that organizes information in long-term memory, facilitates prediction, and helps interpret meaning in reading materials. Similarly, Cheng and Zheng (2002) view schema as a dynamic structure that evolves continuously based on an individual's prior knowledge and experiences. While scholars may vary in their definitions of schema, they generally agree that it refers to the structured knowledge framework people develop through life experiences. This cognitive structure actively influences how new information is processed, as readers naturally interpret unfamiliar concepts through the lens of their prior knowledge.

2.1.2 Classification of schema

As proposed by schema theory, reading proficiency depends on three key schemata: linguistic (language-related knowledge), formal (understanding of text organization), and content (prior topic familiarity). Each schema corresponds to and processes different aspects of reading materials—language, structure, and meaning (Li, 2005).

(1) Linguistic schema

Linguistic schema represents how students organize their language knowledge mentally, including their understanding of vocabulary, sentence structures, and grammatical rules. As fundamental components of linguistic schemata, vocabulary and grammar provide the necessary groundwork for building content and formal schemata. The English Curriculum Standards for Senior High School (2020) explicitly emphasizes that language knowledge serves as the foundation for developing comprehensive language competence. Only with sufficient mastery of linguistic elements can students effectively process textual information by recognizing key vocabulary, which in turn activates their existing content and formal schemata, ultimately leading to successful reading comprehension.

(2) Content schema

This concept relates to a reader's familiarity with the topic or their prior experience and background knowledge about the article's subject. Even when students possess sufficient language skills, they may still struggle to comprehend English texts if they lack relevant contextual understanding. Reading requires students to have certain cultural background knowledge. Even when students possess adequate linguistic knowledge, they may still fail to activate the relevant content schemata needed for full comprehension. As Carrell (1983) noted, text comprehension involves an interactive process between readers' cultural background knowledge and the text itself. This means that understanding a text requires more than just knowledge of its structure and language; readers must also draw upon broader contextual and cultural knowledge. Language is not merely a combination of vocabulary, grammar, and syntax—it is deeply embedded with cultural meaning at every level (Pei, 2002).

(3) Formal schema

This refers to recognizing the structural framework and stylistic characteristics of written works. As reading materials primarily serve as vehicles for information transmission, textual analysis should extend beyond superficial linguistic structures to incorporate discourse-level examination. Formal schemata enable readers to anticipate informational relationships within texts and predict the sequential organization of specific details. Different types of articles have different structure. Only when students are familiar with the genre and structure of the article, can they read effectively, and achieve the purpose of improving their reading ability. In English, discourse mainly appears in four types: argumentative, expository, descriptive and narrative. Students need to grasp the structural elements of various literary forms - including novels, biographies, fables, plays and poems - to establish proper formal schemata. Linguistic schema is the premise of reading, without which reading is impossible. However, having only the linguistic schema without the content schema related to the topic of the text will also bring difficulties to reading comprehension. Therefore, successful reading comprehension requires the integrated operation of all three schemata, as they complement each other's functions.

3. The defects of traditional reading teaching method

Since the 1950s, Chinese reading teaching has been influenced by the bottom-up model. Based on this model, reading is a passive decoding process. The teaching method is based on grammatical translation, and the classroom atmosphere is teacher-centered, and teachers spend much time on explaining words, practicing sentence patterns, analyzing grammar and translating texts. The traditional method disproportionately stresses language knowledge learning, disregards communicative functions, and inadequately trains students in reading techniques. When teaching reading, teachers often neglect to guide students to take the initiative to participate in reading activities. As a result, reading class becomes a single language knowledge explanation class. Due to this teaching approach, students may recognize every word in a passage yet struggle to quickly identify its main idea, make logical inferences about the content, or discern the author's purpose.

Moreover, if the teacher only teaches words and grammar in the reading class, it gives the students a hint that the focus of language learning is language knowledge. Students will devote more attention to the understanding and analysis of the language knowledge in the article. Students are not acquiring more cultural knowledge through reading, not enhancing language sense and cultivating reading skills through reading, but simply accumulating language knowledge. Since the students' reading has always stayed at a lower level of language knowledge, they are not good at using various strategies and cultural knowledge at a higher level to speculate, assume and judge the meaning of the article. Traditional English instruction has long prioritized memorizing words and grammar, consuming substantial teaching resources while yielding limited results. This approach mistakenly views reading as a

passive decoding process rather than an active comprehension activity.

In fact, reading is a process of active speculation and confirmation, a process of associating new information with background knowledge students already have in their brain. Reading materials only provide the reader with clues and directions to activate the schema, and its significance lies not in the reading material itself, but in the schema already existing in the reader's mind (Shang & Zhang, 2015). Reading is not only to connect the meanings of the words one understands, but also to involve the reader's active participation in understanding. Therefore, when taught through traditional reading methods, students do not engage proactively, making schema construction impossible—and activation or consolidation even more unattainable. Although the teachers teach carefully and the students listen carefully, the students' reading comprehension ability could not be improved. The problem caused by traditional reading teaching method is that students rely too much on teachers, and lack of initiative. Facing these problems, teachers should consciously use schema theory to guide students to use scientific methods in English reading.

4.Problem Solutions

Schema theory plays a crucial role in senior high school English reading instruction. This theory posits that reading comprehension occurs when learners activate relevant schemata and integrate new information to enrich these cognitive frameworks. The integrated content may consist of directly understood material or logically inferred knowledge. Complete comprehension is achieved when all key elements within the schema are properly filled. Research by Shi (2005) demonstrates that implementing schema theory in high school English reading classrooms can significantly enhance students' reading comprehension skills.

4.1 Enrich students' linguistic schema

4.1.1 Help students develop vocabulary learning strategies

Vocabulary is the foundation of language learning. According to Cook (2022), the most prevalent vocabulary retention method involves connecting novel words with prior knowledge through our cognitive memory systems. This strategy addresses the difficulty of learning wholly new terms, which remain as disconnected pieces of information susceptible to rapid forgetting. The traditional vocabulary teaching method is that teachers explain the meaning of words in class and ask students to recite them after class. This teaching method is simple and lacks context, which can not stimulate students' interest in learning. By adopting varied teaching strategies, instructors can stimulate students' cognitive processes during vocabulary learning, thereby strengthening their linguistic competence as their word bank expands. For example, teachers can use a topic to stimulate students' interest in learning vocabulary: teachers can first present a picture with the topic of "school life" and then encourage students to use as many words as they can remember to describe school

life.

4.1.2 Help students develop the guessing skills

Knowing a word means not only being able to recognize and understand its meaning, but also knowing how to use the word appropriately according to the context. When students come across unknown words, instructors should encourage them to infer definitions through contextual clues. Teachers can gradually cultivate students' guessing skills through contextual teaching. Contextual teaching method is that teachers help students understand the meaning of words by creating certain language situations. For example, when teachers teach the word "starvation", they can create the following context: "After three days without food, the children in disaster-hit area were close to starvation." Students can not only use contextual clues to decipher word meanings but also strengthen their understanding of language concepts through this process.

4.2 Activate and consolidate the content schema

4.2.1 Pre-reading

While students reading, sometimes they will find that the words and grammatical structure of the article are not difficult to understand, but they still can not understand the meaning of the text. Students can not only use contextual clues to decipher word meanings but also strengthen their understanding of language concepts through this process. Rather than employing a top-down reading approach, most learners still adhere to conventional bottom-up methods, concentrating primarily on word recognition and sentence analysis. The effectiveness of traditional vocabulary and grammar instruction has increasingly been called into question. According to Harmer (2000), rather than focusing solely on linguistic elements, students should be motivated to engage with the actual content when reading.

Schema theory suggests that establishing connections between students' prior knowledge and relevant cultural background information represents the fundamental aim of pre-reading activities through content schema activation. To enhance reading comprehension, teachers should employ diverse instructional methods to stimulate students' prior knowledge. Before reading begins, preparatory activities should be designed to help learners activate their existing schemata and make predictions about the text content. Although the schema that the students use is not necessarily correct, the schema in the students' mind, once activated, can make them associate with the relevant components that make up the schema. Since different types of schema knowledge reinforce one another, instructional content should align with students' reading materials. This may include cultural background information relevant to the text's theme. By designing real-life reading scenarios and employing questioning techniques or group discussions, educators can effectively activate students' existing schemata while fostering their engagement.

Here are some specific ways to help students activate the content schema: (1) Question and answer method. Questioning can be thought of as another top-down method to reading. To stimulate students' interest and curiosity while activating their prior knowledge, strategic questioning proves highly effective. Before the lesson, educators should design meaningful questions by connecting the text content with students' existing knowledge and experiences. These pre-reading questions serve multiple purposes: they create an engaging classroom environment, spark reading motivation, and help students identify useful strategies for their reading process. (2) Brainstorm. This is a form of creative problem-solving. Students discuss according to the topic given by the teacher. They can quickly extract their existing background knowledge from the brain in a free atmosphere. In this process, students can communicate with anyone, supplement and improve their answers to complete the task together. Through discussion, students can understand the vocabulary, complement their cultural background knowledge, and make more prediction about the article. Schema theory holds that the more schema students have in mind, the stronger their ability to make predictions. Therefore, it is necessary to help students construct relevant schema through pre-reading activities. Teaching activities in the pre-reading stage can help students activate and construct all kinds of schema knowledge, which directly affects the teaching effect in the following two stages. It is an important part of reading teaching that cannot be ignored.

4.2.2 While-reading

To effectively process textual information, learners must apply their existing schemata for appropriate interpretation. This stage requires integrated use of listening, speaking, reading and writing skills, along with diverse reading strategies. When students are familiar with the content of the article, they can use the prediction strategy to activate the content schema according to the existing background knowledge. Students can also grasp the key points and ignore the minor details to deduce the corresponding schematic generalization strategy according to the text structure knowledge. In teaching, with the help of linguistic schema, students can select the correct reading strategies and use the strategies appropriately in the reading process. By drawing upon both the reader's existing mental schemata and the textual content, learners can dynamically select and adapt reading strategies, thereby progressively activating and building relevant content and formal schemata. Also there are some specific teaching methods in this stage. (1) Careful reading: grasp the details of the text and construct students' content schema. To effectively expand students' content schemata, teachers should design varied comprehension questions tailored to the text. By carefully reading and analyzing the material to extract key facts and information, students can deepen their textual understanding while developing critical reading skills. This approach not only reinforces content knowledge but also enhances students' ability to process and retain information from texts. For example, teachers can ask students to use the table to complete in-

formation about the text. (2) Intensive reading: deducing the author's writing intention and enriching students' content schema. On the basis of students' understanding of the details of the article, teachers can put forward some questions to deeply understand the connotation of the article. These questions are often not clearly expressed in the article, which requires students to use their existing experience to make logical reasoning and analysis of the information in the article, and to speculate the author's views and attitudes at a deep level.

4.2.3 Post-reading

To assess reading comprehension effectively, we must examine whether students can identify the article's central theme, understand the author's purpose and intentions, and demonstrate their ability to draw accurate conclusions through logical reasoning and sound judgment. Post-reading tasks are designed to ensure the practical application and reinforcement of schemata by transferring classroom knowledge to real-world language use. Through these activities that integrate listening, speaking, reading and writing practice, students develop authentic language proficiency, fulfilling the fundamental purpose of language education. Therefore, after reading activities, students can discuss, role play and do other activities to consolidate their content schema. By rewriting or adapting content, students can further strengthen their schema, all while receiving teacher guidance to systematically summarize the established knowledge frameworks. As mentioned earlier, students' schema include three types, so the application of schema theory varies according to different purposes and activities. In order to consolidate language knowledge, teachers should focus on the reconstruction of language knowledge. In order to consolidate background knowledge, teachers should focus on the differences of background knowledge and pay attention to the similarities and differences between background knowledge and students' previous experience knowledge so as to help students effectively modify their previous knowledge.

Also there are some specific ways to consolidate content schema in post-reading: (1) Rewrite. Rewriting can be based on the text structure or prompt. In short, under the framework of formal schema, using writing - one of the language output forms - to reinforce the established content schema. (2) Retelling. Teacher gives key words or phrases and then asks the students to retell the article according to the given hints. (3) Role play. In role-play, teachers should make sure that students know what tasks they need to complete and students are encouraged to evaluate their own performance.

4.3 Establish and improve formal schema

The genres of reading materials are classified into expository, argumentative, descriptive and narrative, etc. The ability to recognize different article genres plays a crucial role in reading comprehension. When students quickly identify text types, they can effectively activate their existing formal schemata. This not only facilitates

smoother reading but also enables faster and more accurate understanding of the main ideas, going beyond just language and content influences. Wang (2007) believed that teachers should make full use of textbooks and adopt different teaching strategies and methods according to different types of reading materials to help students establish and consolidate formal schema, guide students to accurately understand reading materials, and further improve students' reading ability and confidence.

There are also some teaching methods to establish and improve formal schema. (1) Cultivate students' text genre awareness. Using the structure of the text to understand the text is a major reading strategy. Therefore, teachers should give specific guidance to students according to different genres. For example, the structure of a narrative essay consists of four parts: beginning, development, climax and ending. (2) Help students master the discourse features. Cohesive marker is another way to analyze discourse. Articles often use conjunctions or phrases to form a variety of relations, such as: time relations, causal relations and progressive relations. Mastering and analyzing these conjunctions and phrases that combine various structural relations is the key to understanding the text quickly. Teachers should guide students to consciously look for the cohesive markers of the article and identify the relationship between sentences and paragraphs through the cohesive markers. This approach enables learners to better recognize discourse patterns, facilitating the formation of formal schemata that ultimately strengthen their reading proficiency.

5. Conclusion

Schema theory has been proven through numerous experiments to significantly enhance English reading comprehension. Since reading represents an interactive process between textual information and a reader's existing knowledge, students must first possess adequate linguistic foundations. When approaching texts, learners utilize contextual clues along with their background knowledge to form logical predictions, enabling successful comprehension. Research indicates that students' reading proficiency directly correlates with their accumulated schemata - the more schemata they possess, the more they can effectively activate during reading. Conversely, comprehension breakdowns often occur due to either insufficient schema or failure to activate relevant knowledge structures. This underscores the teacher's critical role in facilitating schema activation, expanding students' knowledge frameworks, and helping them consciously integrate previously unutilized information into their reading processes. To enhance students' reading comprehension, teachers must prioritize vocabulary expansion and foundational grammar mastery. However, while teaching these linguistic elements, they should also emphasize the critical role of background knowledge. By employing effective instructional methods, educators can systematically develop students' content schemata. This approach enables learners to leverage their prior knowledge for logical predictions, leading to accu-

rate text interpretation and overall improvement in reading skills. Besides, the traditional “bottom-up” model cannot be ignored, especially in the primary stage of learners’ learning, teachers should pay more attention to vocabulary and grammar, and train learners to quickly master a large number of vocabulary and grammatical structures, so that they can read more extensively in the future learning stage and build more schema networks required for reading

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