

The Application of Schema Theory in Senior High School English Reading Comprehension Teaching

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Abstract

Developing students' reading ability is one of the primary tasks in senior high school English reading teaching. Experimental evidence suggests that the effective application of schema theory in English reading instruction has a significant impact on whether students' reading ability can be rapidly improved. This paper explores the importance of cultivating students' reading ability in senior school English teaching and emphasizes the analysis of the application of schema theory in English reading teaching and its notable influence on enhancing students' reading ability. The article first introduces the definition, development process, and theoretical foundation of schema theory. Subsequently, through case analysis and comparison with traditional senior high school English reading teaching, it reveals the application effects and existing problems of schema theory in senior high school reading comprehension teaching. Finally, the article proposes corresponding feasible solutions, aiming to provide references for the future application of schema theory in senior high school English reading comprehension teaching. It is anticipated that these insights will enhance students' interest and ability in reading comprehension, thereby maximizing the effectiveness of schema theory in senior high school English reading comprehension teaching.

Keywords

Senior High School English Reading Comprehension Teaching; Reading Ability; Schema Theory; Application Effects; Feasible Solutions.

1. Introduction

1.1. Research Background

In the context of globalization and informatization, English, as an essential tool for international communication, plays a crucial role in cultivating students' comprehensive language ability and cultural literacy through its reading comprehension teaching. However, traditional English reading comprehension teaching tends to focus excessively on the explanation of linguistic knowledge such as vocabulary and grammar, neglecting the role of students' cognitive processes and background knowledge. This approach often results in students lacking sufficient comprehension ability and reading interest when confronted with complex texts.

Schema theory, a cognitive psychology theory, posits that people understand new things based on their existing knowledge and experiences, referred to as "schemas." (1). This theory is particularly significant in reading comprehension as readers can utilize their pre-existing knowledge (i.e., schemas) to understand and predict the content of a text. Schema theory emphasizes the role of students' background knowledge in reading comprehension and views the process as an interaction between the reader and the textual information. Schema theory provides a new theoretical foundation for English reading comprehension teaching. It underscores the student's subjectivity and the importance of their pre-existing knowledge, providing robust support for English teachers in developing teaching strategies and designing educational activities.

As the reform of English reading comprehension teaching progresses, increasing numbers of teachers are exploring new teaching methods and strategies. Schema theory, as an effective teaching tool, can meet this practical demand, assisting students in better understanding textual content and enhancing their reading comprehension abilities (2).

1.2. Research Purposes and Significance

The current study aims to deepen the understanding of schema theory by analyzing its fundamental concepts and principles, thereby enriching and developing the theoretical framework of reading comprehension teaching. Secondly, the research explores the role and mechanism of schema theory in reading comprehension teaching, providing new perspectives and ideas for related research. Meanwhile, through case analysis, this study intends to validate the effectiveness of schema theory in enhancing students' reading comprehension abilities, stimulating their reading interest, and boosting their confidence. Furthermore, the study investigates the specific implementation strategies of schema theory in reading comprehension teaching, assisting teachers in better utilizing schema theory to guide their teaching practices and providing concrete guidance for teaching. Finally, the study summarizes the advantages and challenges of schema theory in reading comprehension teaching, proposing improvement strategies and suggestions.

2. Literature Review

Schema theory, as an important cognitive psychology theory, has received extensive attention and application in the field of education, especially in senior high school reading comprehension teaching, since its proposal. This theory not only has a profound research foundation abroad but has also gradually formed a relatively systematic research system in China.

2.1. Current Research Status Abroad

Research on schema theory abroad started relatively early, with a history of over two hundred years (3). Initially, German philosopher Immanuel Kant discussed the philosophical significance of schemas in his works, emphasizing the connection between new knowledge and inherent knowledge. Subsequently, psychologists introduced this concept into the field of psychology and gradually extended it to the field of education. In the early 20th century, Gestalt psychologists and Swiss psychologist Jean Piaget conducted thorough explorations of schema theory, laying the foundation for its application in education.

Entering the 1930s, the research of experimental psychologist Frederick Bartlett was regarded as a classic exploration in the establishment of schema theory, providing theoretical support for the application of schema theory in reading comprehension. American intelligence expert David Rumelhart provided a comprehensive and systematic interpretation of schema theory, proposing schema reading theory, which further clarified the role of schemas in the process of reading comprehension. By the 1980s, schema theory had become an important component of reading theory and was widely used in foreign language teaching to explain the psychological language processing of foreign language learners.

In specific applications of senior high school reading comprehension teaching, foreign scholars have conducted empirical research to verify the effectiveness of schema theory in enhancing students' reading comprehension abilities. They have found that by activating relevant schemas in students' minds, it can help students better understand new information and improve reading efficiency. Furthermore, foreign research also emphasizes the integration of schema theory with specific teaching strategies, such as guiding students' reading practice by constructing language schemas, content schemas, and form schemas.

2.2. Current Status of Domestic Research

Research on the application of schema theory in senior high school reading comprehension teaching in China started relatively late but has developed rapidly in recent years. Based on the introduction of schema theory, domestic scholars have conducted extensive and beneficial explorations in conjunction with the actual situation of senior high school reading teaching in China.

In theoretical research, domestic scholars have conducted deep discussions on the concept, classification, and functions of schema theory, clarifying its applicability and importance in senior high school reading comprehension teaching. They believe that schema theory can not only help students better understand and remember reading materials but also promote students' cognitive development and thinking ability enhancement.

In teaching practice, domestic scholars have attempted to apply schema theory to English reading teaching in senior high schools and achieved significant results. They have helped students establish a systematic reading knowledge system by constructing language schemas, content schemas, and form schemas. At the same time, they also focus on cultivating students' reading strategies and critical thinking abilities to improve their overall reading literacy.

Furthermore, domestic scholars also emphasize the integration of schema theory with modern educational technology, utilizing multimedia, networks, and other teaching resources to enrich students' reading experience and learning methods. They design interactive reading tasks, conduct group cooperative learning, and other methods to stimulate students' interest and enthusiasm, further enhancing the effectiveness of reading teaching (4).

2.3. Summary and Prospect

In summary, both domestic and foreign research on the application of schema theory in senior high school reading comprehension teaching have made significant progress. Foreign research has taken the lead in theoretical construction and empirical research, providing valuable reference experience for domestic research. Domestic research, on the other hand, focuses more on exploration and innovation in conjunction with local actual situations, forming a research system with Chinese characteristics.

In the future, with the continuous development of educational technology and the ongoing updating of teaching concepts, the research on the application of schema theory in senior high school reading comprehension teaching will exhibit a more diversified and deepened trend. We anticipate that scholars from both domestic and foreign countries will continue to strengthen exchanges and cooperation, jointly promoting the application and development of schema theory in senior high school reading comprehension teaching.

2.4. Definition of Schema Theory

Schema Theory was first proposed by German philosopher Kant in the 18th century (5). He believed that schemas serve as the link between concepts and perceptual objects. Subsequently, Swiss psychologist Piaget and AI scientists such as F.C. Bartlett and D.E. Rumelhart further developed this theory and applied it to various fields such as psychology, education, and artificial intelligence. In the modern schema theory framework, schemas are regarded as structural knowledge or knowledge units that exist in human minds. They act as intermediaries between things and language and represent a psychological structural network that reflects human understanding and cognition of the world.

2.5. Types of Schema Theory

Schema theory can be broadly classified into the following types.

Linguistic schema: This refers to the reader's prior knowledge of language, including aspects such as phonetics, vocabulary, and grammar. It is the foundation of reading comprehension

because readers need to possess sufficient language knowledge to decode the language symbols in the text and further understand its meaning.

Content schema: This refers to the reader's familiarity or background knowledge of the topic discussed in the article. Content schema helps readers predict text information, eliminate ambiguities, and deepen their understanding of the text content. If readers are not familiar with the content of the article, they may struggle to fully understand the text even if they have adequate language knowledge.

Formal schema: This refers to the reader's understanding of the genre and organizational structure of the article. Different genres have distinct structural characteristics, such as expository texts, argumentative essays, novels, etc. Formal schema aids readers in quickly grasping the overall context and logical structure of the article.

Additionally, some scholars have proposed concepts such as strategy schema to describe various strategies and techniques used by readers during the reading process.

2.6. Theoretical Foundations of Schema Theory

The theoretical foundations of schema theory primarily stem from cognitive psychology and information science. Cognitive psychology emphasizes that human cognition is an active and constructive process, with schemas serving as the foundation and core of this constructive process. Information science provides a theoretical framework for information processing and storage, which helps explain the storage and activation mechanisms of schemas in human memory. Specifically, the theoretical foundations of schema theory include the following aspects:

Cognitive constructivism: This perspective views human cognition as an active and constructive process, where individuals understand and interpret new information through their existing knowledge and experience. Schemas play a crucial role in this process by helping individuals connect new information with their existing knowledge frameworks, thereby enabling understanding and interpretation of the new information.

Information processing theory: This theory emphasizes that the human brain is an information processing system that encodes, stores, retrieves, and processes input information. Schemas, as knowledge structure frameworks, are stored in human memory. When new information is input, the brain activates relevant schemas to process and handle the new information.

Long-Term memory and Activation-Spreading model: This model suggests that human memory can be divided into two types: short-term memory and long-term memory. Schemas, as knowledge structure frameworks in long-term memory, are activated when relevant stimuli appear and spread to other related schemas, forming an activation network that helps individuals understand and interpret new information.

3. Case Analysis

To better highlight the application effect of schema theory in English reading comprehension teaching in senior high schools and identify the challenges of using schema theory in reading instruction so as to propose coping strategies, the author takes "Time for a Change" from the compulsory textbook of New Foreign Language Teaching and Research Press for senior high school grade two as an example, and compares and analyzes two teaching designs: one using schema theory and the other not. The details are as follows.

3.1. Overview of Teaching Using Schema Theory

When teaching "Time for a Change" from the compulsory textbook of New Foreign Language Teaching and Research Press for senior high school grade two, the application of schema theory aims to assist students in activating background knowledge, constructing new knowledge

frameworks, integrating information, developing critical thinking, and ultimately achieving knowledge application and transfer through a series of teaching activities. Schema theory emphasizes that students should continuously adjust and enrich their cognitive structures based on existing knowledge through the input of new information.

3.1.1. Teaching Activity Design (Using schema theory)

Introduction and activation of schema (5 minutes)

Teacher activity: Play a video about Chinese New Year customs, guiding students to recall and discuss their family's Chinese New Year celebration methods, especially the traditions and meanings of the reunion dinner.

Student activity: Watch the video, activate existing schemas about the Chinese New Year and the reunion dinner, and share personal experiences and opinions.

Prediction and initial schema construction (10 minutes)

Teacher activity: Display the text title "Time for a Change" and guide students to predict the article content, initially constructing a schema framework that may involve changes in reunion dinner customs.

Student activity: Predict the text content based on the title and preview materials, attempting to draw an initial schema framework on paper.

Reading and detailed schema (20 minutes)

Quick reading: Students quickly browse the text, identify the main idea of each paragraph, and initially fill in the schema framework.

Detailed reading: Students carefully read the text, look for specific information supporting the author's viewpoint, refine the schema content, and annotate key words and sentences.

Group discussion: Students discuss their respective schema content in groups, share information, and revise and improve the schema.

Critical thinking and schema expansion (15 minutes)

Teacher activity: Guide students to think about the reasons, impacts, and personal viewpoints of changes in reunion dinner customs, encouraging them to conduct critical evaluations based on the schema content.

Student activity: Express personal viewpoints on changes in reunion dinner customs within the group or in the whole class, using information from the schema as arguments for deep discussion and exchange.

Application and output (15 minutes)

Role-playing or debate: Organize students to engage in role-playing or debate around "Whether the reunion dinner should be eaten at home or outside," requiring them to use information from the schema and critical thinking for elaboration.

Written assignment: Assign a short essay task, requiring students to write an article about their opinions and suggestions on changes in reunion dinner customs, incorporating schema content and classroom discussions.

3.2. Case Analysis of Teaching without Using Schema Theory: "Time for a Change"

3.2.1. Teaching Activity Design (Without Using Schema Theory)

Introduction of new lesson (5 minutes)

Teacher activity: Directly introduce the text title and background, briefly describing the main idea of the article.

Student activity: Receive information passively, lacking a clear activation of existing knowledge.

Reading the text (25 minutes)

Teacher activity: Ask students to quickly read the text and then explain the text content by paragraphs.

Student activity: Follow the teacher's explanation, take notes passively, and lack opportunities to actively construct knowledge frameworks.

Discussion and summary (15 minutes)

Teacher activity: Ask several questions about the text content and guide students to answer.

Student activity: Answer the teacher's questions, but the discussion is not deep enough, lacking the stimulation of critical thinking.

Assignment (5 minutes)

Teacher activity: Assign written homework, requiring students to retell the text content or answer post-class questions.

Student activity: Complete written homework, but the assignment form is single, lacking innovation and practical applicability.

3.3. Differences between These Two Teaching Designs

3.3.1. Differences in Teaching Activity Design

There are some differences in the teaching activities between the two teaching designs, here is the detailed information.

Activating prior knowledge: Schema theory emphasizes activating students' existing knowledge, while non-schema-based teaching often directly introduces new lessons, lacking this important step (6).

Knowledge construction process: Schema theory gradually constructs and improves students' knowledge framework through activities such as prediction, reading, and discussion, while non-schema-based teaching relies more on teacher explanations, with students in a passive state of reception.

Cultivating critical thinking: Schema-based teaching encourages students to engage in critical evaluation and deep discussion based on schematic content, while non-schema-based teaching seldom involves the cultivation of critical thinking.

Knowledge application and transfer: Schema-based teaching promotes the application and transfer of knowledge through role-playing, debates, written assignments, and other forms, while non-schema-based teaching largely remains at the level of retelling and understanding textbook content.

3.3.2. Differences in Teaching Effectiveness.

There are also some differences in the teaching effectiveness between the two teaching designs, here is the detailed information.

Interest and enthusiasm in learning: Schema-based teaching can stimulate students' interest and enthusiasm in learning because students need to actively participate in the knowledge construction process, while non-schema-based teaching may lead to students feeling bored and uninterested.

Reading comprehension and critical thinking skills: Schema-based teaching can significantly improve students' reading comprehension and critical thinking skills, while non-schema-based teaching may have little effect in this aspect.

Knowledge mastery and application ability: Schema-based teaching helps students better master and apply the knowledge they have learned, while non-schema-based teaching may result in students' understanding and application of knowledge remaining superficial.

Through the above comparison, it is not difficult to find that compared with traditional teaching, schema theory has significant advantages in teaching English reading comprehension in senior high schools. It can effectively enhance students' background knowledge, activate existing

schemas, and accelerate information processing speed and so on. In summary, schema theory is an effective teaching method worth promoting.

4. Problems and Strategies of Schema Theory in English Reading Teaching in Senior High School

4.1. Existing Problems

4.1.1. Inadequate Vocabulary

Vocabulary is the foundation of reading comprehension, but many senior high school students lack sufficient vocabulary, leading to frequent encounters with unfamiliar words during reading. This not only affects reading speed but also hinders the understanding of the deeper meaning of the text.

4.1.2. Insufficient Comprehension

Even if students know every word in a sentence, they may still struggle to understand the whole sentence accurately due to complex sentence structures or lack of cultural background knowledge. This can lead to misunderstandings of the content or an inability to fully grasp the main idea of the article.

4.1.3. Slow Reading Speed

Some students have a habit of reading word by word and pausing at unfamiliar words or difficult sentences. This reading method results in a slow reading speed, affecting their ability to complete reading tasks within a limited time and potentially leading to incomplete answers during exams due to time constraints.

4.1.4. Inappropriate Teaching Methods

Currently, many senior high school English teachers adopt teaching methods that are not entirely appropriate for reading instruction, such as relying too much on grammar explanation and neglecting the teaching of cultural background knowledge. These inappropriate teaching methods reduce the efficiency of reading instruction and fail to effectively enhance students' reading comprehension abilities.

4.1.5. Unfamiliarity with Schema Theory

As a new teaching concept, schema theory is relatively unfamiliar and challenging for many students to grasp. Their unfamiliarity with schema theory may lead to confusion and stress during the learning process, thereby affecting learning outcomes.

4.1.6. Limited Knowledge

Influenced by exam-oriented education, many senior high school students have a relatively narrow knowledge base, lacking rich cultural background knowledge and interdisciplinary knowledge. This limits students' ability to associate within the schema theory, making it difficult for schema theory to fully exert its advantages.

4.2. Solution Strategies

4.2.1. Strengthen Vocabulary Teaching to Enhance Students' Vocabulary

Teachers should focus on vocabulary accumulation and application, helping students expand their vocabulary through vocabulary explanation, example sentence presentation, and vocabulary exercises. For instance, when teaching the word "environment," teachers can list related vocabulary such as "pollution" and "conservation" and help students consolidate their memory through example sentences and exercises. An increased vocabulary will directly enhance students' reading speed and comprehension ability (7).

4.2.2. Activate Students' Existing Schemas to Facilitate Understanding

Before reading, teachers can activate students' existing schemas related to the reading material through questions and discussions. For example, before reading an article about "environmental protection," teachers can ask students, "What do you know about environmental protection? What do you think is the importance of environmental protection?" This can guide students to combine new information with existing schemas for understanding and inference. Activating schemas helps students understand the content of the article faster and improves reading efficiency.

4.2.3. Teach Reading Strategies to Improve Reading Speed and Accuracy

Teachers should teach students effective reading strategies such as skimming, scanning, and guessing words to help them quickly capture key information during reading. For example, teachers can select a longer article and guide students to use skimming strategies to quickly browse the article and identify the main idea and key information. The use of reading strategies will enhance students' reading speed and accuracy.

4.2.4. Enrich Teaching Content to Stimulate Interest in Learning

Teachers should enrich the content of reading instruction, not only limited to textbook articles but also introducing reading materials closely related to students' lives and with a modern feel. For example, teachers can select English news reports, scientific articles, etc., as reading materials while emphasizing the teaching of cultural background knowledge. This can help students broaden their horizons and understand more about society and cultural backgrounds. Enriched teaching content will stimulate students' interest and enthusiasm in learning and improve their reading comprehension abilities.

4.2.5. Improve Teaching Methods to Enhance Teaching Pertinence

Teachers should improve traditional teaching methods and adopt more flexible and diverse teaching approaches. For example, teachers can use text analysis methods guided by schema theory to guide students in analyzing the text structure and information organization of articles, or use group cooperative exploration methods to allow students to discuss the difficulties and key points in the article together. At the same time, teachers should pay attention to individual differences among students and teach according to their aptitude. Improving teaching methods will enhance the pertinence and effectiveness of reading instruction and meet the learning needs of different students.

4.2.6. Cultivate Students' Autonomous Learning Ability to Improve English Proficiency

Teachers should encourage students to engage in autonomous learning, such as reading English originals and watching English movies, to improve their English proficiency. For example, teachers can recommend suitable English originals for students to read and guide them in making reading plans, or organize students to watch English movies and discuss and exchange their thoughts after watching. At the same time, guide students to establish their own knowledge base and schema system. The cultivation of autonomous learning ability will benefit students throughout their lives and help them continuously improve their English proficiency in future studies and work (8).

5. Conclusion, Limitations, and Future Research Directions

5.1. Conclusion

The application of schema theory in senior high school English reading instruction has achieved remarkable results, such as enhancing students' reading interest and ability, and stimulating their learning enthusiasm and initiative. However, there are also some limitations. To fully leverage the advantages of schema theory, teachers need to strengthen the cultivation of

students' language skills, ensure a smooth transition from traditional teaching modes to schema theory-based instruction, and continually improve their own professional expertise and guidance capabilities. Only in this way can schema theory be better utilized to enhance students' reading comprehension and overall language proficiency.

5.2. Limitations

When writing such a thesis, the quantity and breadth of literature collected are crucial indicators for assessing the comprehensiveness of the research. However, this study may have collected a relatively small number of literature sources, potentially failing to fully cover the current status, research outcomes, and development trends of schema theory in senior high school English reading instruction (9). Additionally, the sources of literature in this study are relatively homogeneous, lacking interdisciplinary and cross-cultural comparative studies, which limits the research perspective and makes it difficult to comprehensively reveal the application effects of schema theory in different contexts. Furthermore, the research method employed in this thesis is relatively monotonous, relying heavily on case analysis without designing experiments to verify the actual effects of schema theory in senior high school English reading instruction. The conclusions are drawn solely based on experience summaries and literature reviews, lacking empirical support.

5.3. Future Research Directions

Future research on "The Application of Schema Theory in senior high school English Reading Instruction" should expand and deepen in aspects such as broadening the scope and depth of literature collection, adopting diversified research methods, and extending research samples and contexts. This will help to more comprehensively reveal the application effects and limitations of schema theory in senior high school English reading instruction, providing more effective guidance for teaching practice.

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