

Cultivation of Senior English Reading Strategies Based on Cognitive Load

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How to cite this paper: Zheng, H. W. (2026). Cultivation of senior English reading strategies based on cognitive load. *Education and Social Work*, 3(3), 1 - 14. ISSN Print: 3079-515X; ISSN Online: 3079-5168.

<https://doi.org/10.63313/ESW.9108>

Published: 2026-02-12

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Abstract

Against the backdrop of new curriculum reform emphasizing core competencies, English reading is increasingly valued for its role in language acquisition and holistic development. However, high school English reading instruction faces persistent challenges, as students often struggle to master effective strategies to improve efficiency. From a cognitive load perspective, suboptimal teaching approaches may impose excessive cognitive burdens on learners. To address this, this study investigates factors influencing senior high school students' English reading through the cognitive load theory and proposes feasible reading strategies. By reviewing relevant domestic and international literature and analyzing teaching cases, this research examines the cultivation of English reading strategies within a cognitive load framework. Five practical strategies are proposed: time allocation, attention management, information processing, schema automation, and schema construction. These strategies aim to inform teaching practices, support learners in reading more effectively, and foster autonomous learning abilities, thereby equipping students to better navigate the information era and engage in knowledge innovation in the future.

Keywords

Senior English reading; Cognitive load; Reading strategies

1. Introduction

At present, China is advancing a new round of basic education curriculum reform to cultivate talents suited for the globalization and information age. Core Competency, central to this reform, emphasizes students' holistic development. English reading, as a key avenue for language input, plays a vital role in fostering English subject core competencies—enhancing language skills, cultural awareness, critical thinking, and lifelong learning. It prepares learners for future innovation and global engagement. However, high school English reading instruction faces persistent challenges: students often read slowly, struggle with vocabulary and complex texts, lack interest, and misinterpret details. These issues are largely attributed to ineffective use of

reading strategies. Under the “double reduction” policy, which emphasizes teaching quality and reduced student burden, cultivating efficient learning strategies becomes essential. Moreover, in an era of information overload, mastering effective reading strategies can alleviate cognitive load, boost reading efficiency, and enhance learners’ competitiveness.

This study aims to investigate the impact of three types of cognitive load on high school students' English reading based on Sweller's Cognitive Load Theory and propose practical reading strategies to address existing problems. The research holds both theoretical and practical significance. Theoretically, it enriches the application of cognitive load theory in subject teaching, offering fresh insights into high school English reading. Practically, it provides feasible strategies to help students improve reading efficiency, develop core competencies, and strengthen future competitiveness.

2. Literature Review

2.1. Definition of Cognitive Load

Cognitive Load Theory is an instructional theory based on knowledge of human cognitive structures, with a core focus on the finiteness of working memory. Cognitive load is defined as the request for working memory resources demanded by the learner to meet the objectives of a particular task (Kalyuga & Plass, 2018). In China, cognitive load refers to the total amount of load borne by the working memory system in processing and retaining information for a specific cognitive task (Tang & Zhou, 2008). And based on the interaction between human cognitive structure and external information structure, cognitive load theory determines the instructional design to some extent.

Cognitive load is a multi-dimensional concept, divided into three categories according to the source and nature of the main influencing factors: intrinsic cognitive load (ICL), extraneous cognitive load (ECL), and germane cognitive load (GCL). ICL refers to the load generated by the cognitive processing activities of working memory on the number and interaction of information elements contained in the cognitive task itself and it is influenced by the complexity of the learning material and the learner’s prior knowledge. ECL is mainly determined by the way learning materials are organized and presented, and may be modulated through instructional design. GCL is generated when learners use the remaining cognitive resources for directly related processing of learning, which is generally considered to promote learning (Gu & Yin, 2017). Thus, in order to promote the occurrence of effective learning, the external cognitive load should be reduced as much as possible in the teaching process and the germane cognitive load should be increased. The total cognitive load should not exceed the cognitive load that the individual learners can bear.

2.2. Definition of Reading Strategies

When it comes to reading strategies, it is necessary to think about what reading comprehension is. Reading comprehension can be viewed as the process of gaining meaning from the printed page. Specifically, Wagner et al. (2009) regarded reading comprehension as a complex skill which requires readers to understand the meaning of each word, to make sense of each sentence, to construct a mental representation by integrating background knowledge of the text. Strategies are the techniques used by the learner to enhance reading comprehension.

Wang (2020) argued that different from reading method, which is a kind of procedural knowledge, reading strategy belongs to metacognitive knowledge and comes from psychological research. Its connotation includes learning strategy, reading comprehension strategy and self-monitoring and regulation. Liu (2002b) believed that reading strategies have a broader meaning than reading skills, including not only some reading skills, but also the selective behaviors taken by readers to achieve the purpose of reading, which can help readers to understand the article thoroughly.

Therefore, it can be concluded that reading strategy refers to a series of conscious methods and skills adopted by readers in order to understand, analyze and remember text content more effectively in the process of reading. The choice and use of reading strategies depends on the reader's goals, the type of text and the reading context. Through the flexible use of these strategies, readers can obtain and process information more efficiently and achieve the purpose of reading.

2.3. Previous Research on Cognitive Load

Cognitive Load Theory (CLT), pioneered by John Sweller in the late 1980s, is fundamentally anchored in the architecture of human cognitive structures, specifically the limitations of working memory (Sweller, 1988). It posits that learning and problem-solving require the consumption of finite cognitive resources. When the intrinsic demands of processing new information, the complexity of the material, and the format of its presentation collectively exceed working memory capacity, cognitive overload occurs, severely impeding learning efficacy (Sweller et al., 2011). Over four decades, CLT has evolved into a foundational framework influencing instructional design across diverse fields.

Internationally, research has heavily concentrated on the mechanics of working memory and its interaction with long-term schema acquisition. Sweller's (1988) initial work framed cognition as a resource-consuming process, a concept that has been extensively validated and refined through empirical studies. European and American scholars have broadened CLT's application from core pedagogy and psychology to specialized domains like medical training, focusing on mitigating cognitive overload through optimized instructional formats. Recent international trends explore the evolution of human cognitive architecture itself, seeking to deepen the theoretical underpinnings of CLT.

In the Chinese academic context, the introduction and development of CLT research

have followed a distinct trajectory. Scholars like Tang and Zhou (2008) delineate a two-phase vertical development: an initial decades-long focus on experimental studies concerning learning material design and instructional effectiveness, followed by a post-2001 period characterized by theoretical expansion and validation of earlier design principles. Horizontally, domestic research converges on two primary themes: the evaluation of instructional design effectiveness and the measurement of cognitive load itself (Tang & Zhou, 2008). Furthermore, researchers have systematically synthesized key instructional effects derived from CLT. For instance, Pang (2011) summarized twelve CLT effects—such as the worked-example effect, modality effect, and expertise reversal effect—and explicitly translated these into pedagogical implications. These include the judicious use of authentic learning scenarios, the scientific design of multimedia, and the attention to the relativity of cognitive load among learners with differing prior knowledge (Pang, 2011). This body of work has significantly advanced the integration of CLT into subject-specific teaching practices within China.

In summary, while international research has driven the theoretical frontiers and cross-disciplinary applications of CLT, domestic scholarship in China has made substantial contributions by contextualizing and operationalizing the theory within local educational frameworks. The synthesis of global theoretical insights and localized, practice-oriented research—such as the application of the expertise reversal effect in differentiated instruction—provides a robust foundation for further exploration. Future research, particularly in China, can benefit from adopting more diverse methodological approaches to address existing challenges and further refine CLT-based strategies for complex learning environments.

2.4. Previous Research on Reading Strategies

Strategies are more important than words. International research, systematically developed since the 1980s, recognizes reading strategies as crucial for improving English reading proficiency. Scholars emphasize that strategic competence surpasses vocabulary knowledge in importance. Wallace (1992) highlighted the need for flexible application of strategies—like inference and text analysis—based on text type and reading purpose. Contemporary research extends this to digital contexts, focusing on online reading strategies, while acknowledging their effectiveness varies across individuals and tasks.

In China, research is closely tied to pedagogical practice, with strategy instruction commonly integrated into classrooms. Empirical studies indicate that Chinese EFL learners frequently employ strategies such as skimming, scanning, and vocabulary techniques, and that strategy use positively correlates with reading proficiency (Liu, 2002a). Furthermore, significant differences exist in strategy use between successful and less successful readers (Liu, 2002b). However, Li and Pu (2017) note that theoretical research remains underdeveloped, with studies predominantly

focused on university students, leaving primary, secondary, and advanced learners relatively under-researched. In the context of China's core competencies reform, which emphasizes holistic development, strategy training is considered integral to fostering English subject competencies. Wang (2017) thus advocates for embedding strategy instruction within reading teaching, diagnosing existing problems and proposing guiding principles under the new framework.

In summary, reading strategy training is an established effective approach in EFL contexts like China. Evidence suggests learners at all levels can benefit, with those of lower initial proficiency potentially showing greater gains (Lü & Tu, 1998). This underscores the valuable role teachers play in facilitating strategic reading, even as reading remains a primarily independent activity.

2.5. Previous Research on Cultivation of Reading Strategies Based on Cognitive Load

The foundational premise of Cognitive Load Theory (CLT) is the limited capacity of working memory; exceeding this capacity impedes learning. Research applying CLT to reading strategy cultivation has yielded insights. Gu and Yin (2017), investigating input modalities, found that while total cognitive load across visual, auditory, and audio-visual modes was comparable, visual input generated the highest germane cognitive load, thereby enhancing learning motivation.

Effective teaching hinges on the strategic management of these limited cognitive resources. Empirical studies in the Chinese context identify specific cognitive load challenges in English reading instruction. Huang (2019) revealed issues in high school students' cognitive load and a theory-practice gap among teachers, proposing corrective measures. Yan and Zhao (2021) further diagnosed that high intrinsic load stems from knowledge deficits, high extraneous load from poor instructional design, and low germane load from insufficient strategy guidance, collectively hindering learning. They consequently argued for developing teaching strategies that regulate cognitive load and incorporate explicit strategy training.

In summary, while international CLT research effectively integrates theory and practice to mitigate intrinsic and extraneous load, its application to language teaching remains underexplored. Domestic studies have made progress in applying CLT to English classrooms. However, a significant gap persists: few studies specifically investigate how the three types of cognitive load impact senior high school English reading or how to cultivate efficient reading strategies to reduce such load. This gap is critical given the heightened academic demands at this level, including expanded vocabulary, complex texts, and greater need for background knowledge and self-directed learning. This study aims to address this gap, offering both theoretical and practical value.

3. Theoretical Basis

3.1. Information Processing Theory

Information processing theory, a fundamental theory in cognitive psychology, views human cognition as a process of information handling, involving attention, encoding, storage, and utilization. Its emphasis on the limited capacity of short-term memory aligns with Cognitive Load Theory's core premise (Wan, 2015). Both theories agree on the necessity to manage cognitive resources: reducing the burden on short-term memory corresponds to minimizing extraneous cognitive load, while promoting deep encoding activities relates to fostering germane cognitive load, which is crucial for processing reading materials (Lin, 2010).

This theoretical framework underpins the cultivation of reading strategies. Strategies aimed at filtering and organizing information (e.g., skimming, using graphic organizers) help manage the load on working memory. Conversely, strategies that encourage analysis, synthesis, and connection to prior knowledge engage learners in the meaningful encoding that this theory and Luo (2020) associate with developing higher-order thinking skills essential for English reading comprehension.

3.2. Theory of Cognitive Development Stages

Piaget's theory of cognitive development introduces schema as the fundamental unit of cognitive structure. The acquisition and automation of schemas compensate for the limitations of working memory capacity: well-developed schemas stored in long-term memory can be activated and processed automatically, reducing the conscious cognitive effort required during learning, thereby lowering an individual's overall cognitive load (Liu & Zhang, 2003). In English reading, schemas can be categorized into language schema, content schema, and formal schema. Through repeated reading, students accumulate and automate these schemas, which facilitates efficient retrieval and processing of textual information, thus alleviating cognitive load during reading tasks.

The dynamic processes of assimilation, adaptation, and equilibrium explain how learners integrate new information into existing cognitive structures. When readers encounter unfamiliar content, their existing schemas are adjusted to accommodate new knowledge, promoting deeper comprehension and schema reconstruction. This highlights the importance of designing reading instruction that allows sufficient time for students to assimilate new material, activate relevant prior knowledge, and consciously develop self-regulated learning strategies. Teachers can strategically foster schema construction and automation through guided practice, which directly supports the management of cognitive load and enhances the effectiveness of reading strategy training.

4. Impact of Cognitive Load on High School Students' English Reading Strategies

4.1. Impact of ICL on English Reading

Intrinsic cognitive load originates from the cognitive task itself. In a certain sense, it reflects the complexity and difficulty of the task itself, that is, the more difficult the task is, the more intrinsic cognitive load will be imposed on the working memory. In addition, the complexity of cognitive tasks is also closely related to learners' knowledge experience. In other words, the same cognitive task will produce different internal loads for different learners.

In the process of senior English reading, ICL refers to the mental effort required by students in processing and understanding reading materials. This cognitive load is closely related to the complexity of the reading material itself and the language ability of learners. As far as the material itself is concerned, the more complex the vocabulary familiarity, syntax complexity, text logic and text structure, the more cognitive load will be caused to students. In addition, if the reading task is more demanding, such as involving reasoning, critical thinking and other higher-order problems, then ICL will also increase.

As far as learners are concerned, there are great individual differences among different learners, who are different in language level and cognitive ability, and tend to adopt different reading strategies. Learners also differ in their understanding of the background knowledge related to the material. If students are unfamiliar with the topic of the reading and do not know much about the relevant background knowledge, then they need to mobilize more mental effort or cognitive resources.

For example, in English reading materials, the number 2008 is often closely related to the economy. If students are familiar with the global financial crisis that broke out in the United States in 2008, leading to the global economic recession, it is likely to help them quickly grasp the gist of the text. It is easy to find that current English reading often involves several major areas: politics, economy, culture, ecology, education, medical care and so on. When students accumulate a certain amount of reading, they will accumulate schema knowledge on related topics, just like a folder that can be modified at any time, which is conducive to their retrieval and update of information and improve reading efficiency.

Therefore, teachers are encouraged to help students accumulate relevant subject vocabulary and activate relevant background knowledge (Yan & Zhao, 2021), which will effectively reduce their internal cognitive load.

4.2. Impact of ECL on English Reading

Extraneous cognitive load, also known as ineffective load, refers to the load imposed on working memory due to inappropriate instructional design leading to activities not directly related to cognitive processing. If the design and presentation of cognitive tasks are not helpful to the substantive cognition, it will make the working memory produce unnecessary cognitive operations and increase the load.

In senior English reading, extraneous cognitive load refers to the extra cognitive

load caused by the design of reading materials, the way of presentation or the learning environment. In the formal examination, problems like confusing reading materials typesetting, unclear font, graphic mismatch, noisy learning environment etc. can be effectively avoided. It is worth noting that if the instructions of the reading task are vague, it may also cause students to have difficulty understanding the requirements, thus increasing the cognitive load.

ECL has great enlightening significance to instructional design. For example, clever and relevant introductions can keep students' minds active and ready for the following reading. Teachers should take full account of reducing students' ineffective cognitive load when using multimedia in teaching design. In addition, in the teaching process, it is generally considered unnecessary for teachers to translate and analyze word by word, because it will cause excessive redundant information and increase ELT (Yan & Zhao, 2021).

4.3. Impact of GCL on English Reading

Germane cognitive load is also called effective cognitive load. Different from ineffective cognitive load, this kind of cognitive load is beneficial to learners' learning. Specifically, Pang (2011) pointed out when the requirements of cognitive tasks are low, that is, when the intrinsic cognitive load is low, learners still have sufficient cognitive resources available, and they can devote some additional activities to promote the construction of schemas.

The input of GCL is conducive to learning, because learners connect the new information they face with the existing knowledge by taking notes and making mind maps, so as to deeply understand and integrate them, thus establishing a more solid knowledge structure. For English teaching, teachers can add appropriate examples during lectures, which, although adding some knowledge burden, can promote students to understand the text content more fully.

However, in reality, many students lack this awareness of using GCL to promote learning. Many students have a headache just seeing long paragraphs of text, and it is difficult to calm down and sort out the content of the article. After class, they are not willing to consolidate knowledge, reflect and summarize. Many teachers also lack the awareness of training students' reading strategies, and pay more attention to the practice of a specific article as well as the vocabulary and grammar in the article. It is worth mentioning that some scholars regard learners' emotions as cognitive load. Emotions are ubiquitous in learning. Plass and Kalyuga (2019) described four different ways of considering emotions in the context of cognitive load theory. Emotion can be viewed as extraneous cognitive load as well as intrinsic cognitive load and it can affect learners' motivation. Therefore, teachers need to stimulate learners' emotional states that are conducive to learning and motivate learners to complete relevant tasks.

5. Cultivation of Senior English Reading Strategies Based on Cognitive Load

5.1. Time Allocation Strategy

Effective reading requires efficient use of time. Given the limited time allocated to the reading questions in the test, learners need to be able to process the information resources efficiently. They should fully allocate time in the limited answering time, improve the reading completion and accuracy as much as possible, and grasp the relationship between speed and accuracy.

Firstly, a comprehensive assessment of the length and complexity of the reading materials should be conducted to facilitate an optimal allocation of time. The number of words and new vocabulary in high school English reading materials is not the same. Some articles bring less intrinsic cognitive load to readers, so the reader can speed up the reading of these kind of articles. Secondly, time should be allocated efficiently in accordance with the distinct objectives of the reading task. This requires the reader to read the question first, determine whether the direction of the question is the details or the general idea, and then locate the original text to find the solution. Generally speaking, senior English reading usually has four to five multiple choice questions, which contain not only details, reasoning questions, but also the main idea, emotional attitude questions, so readers need to respond flexibly. Thirdly, it is advisable to promote the conscious application of metacognitive strategies to facilitate self-regulated learning in English reading. Teachers should consciously teach students the advantages of using metacognitive strategies. Make students use metacognitive strategies correctly, so as to allocate reasonable reading time, monitor and adjust their reading process. For example, in the process of reading, if learners find themselves spending too much time on a certain reading text, they need to take a quick break and move on to the next reading text in time, otherwise it will greatly affect the completion of the task.

The above is mainly analyzed from the perspective of learners' learning strategies. For traditional teacher-led English classes, time allocation strategies are more based on teachers' teaching design, which requires them to scientifically and reasonably allocate time to each teaching program according to reading materials, students' current level, teaching objectives and other requirements, and flexibly adjust according to actual teaching practice.

For example, in a lesson plan titled Stronger Together: How We Have Been Changed by the Internet (Luo et al., 2023), the author allocates time reasonably: warm-up for 3 mins, read for information (or for preliminary understanding) for 8 mins, read for comprehension (or for further understanding) for 20 mins, read for application (namely post-reading) for 8mins. Subsequently, the author designs some reading activities or questions at different stages of reading. In the reading for preliminary understanding stage, the author designs some general questions to understand the

main idea of the article, such as viewing the picture as well as the headline and answering questions, finding the topic sentence and telling the main idea, completing the timeline, etc. Such activities can exercise students' reading ability, such as skimming, scanning, and so on.

In the reading for further understanding stage, which is longer than last stage, the author designs an inferring activity and asks students to think critically. At this stage, students have opportunities to train some higher-order thinking skills and be guided to explore the thematic meaning in depth. In the stage of reading for application, the author presents a story-telling task, asking students to reorganize the passage and apply what they have learned in another form. It is obvious that the design of the teaching procedure embodies the learning activity-based approach, integrating learning, thinking and applying. When designing teaching activities, teachers should clearly distinguish between primary and secondary priorities, allocate class time in a well-considered manner, and ensure that all elements are aligned with the achievement of teaching objectives.

In short, teachers need to consciously train students' reading speed in daily teaching, let them read with aims, adjust reading speed appropriately according to different reading purposes, and scientifically allocate limited time resources, so as to effectively improve reading completion and accuracy.

5.2. Attention Management Strategy

Attention management strategy can also be called cognitive resource allocation strategy. First, it is necessary to effectively manage one's attention. Learners should be selective about the reading materials and allocate their cognitive resources appropriately. Specifically, when reading a passage, readers should first grasp the key points of the article. They can do this by focusing on the title, the beginning, the end, the first and last sentences of each paragraph, and other crucial parts. In these common key sections, they should take a moment to think more deeply. For less important parts, they can just skim through without spending too much attention on in-depth thinking. Second, it is also very important to learn to concentrate and try to avoid being distracted. This also requires that readers should preferably read the original text with questions in mind, so as to effectively maintain concentration and avoid distraction. In addition, anxiety can lead to unnecessary cognitive burdens. Therefore, when time allows, learners are advised to first skim through the entire exam paper, checking whether the essay topics are familiar to them and getting a general sense of the exam content and difficulty, so as to scientifically allocate their time and alleviate subsequent anxiety.

In short, teachers should consciously train students' attention during the teaching process. Managing attention during exams is the key to maintaining efficient answering and avoiding mistakes. Before the exam, teachers should also pay attention to creating a comfortable and relaxing environment, reducing sources of

interference, and mobilizing learners' positive emotions.

5.3. Information Processing Strategy

The theory of information processing holds that learning is essentially composed of acquiring and using information. It explains how organisms perceive, encode, store, extract, and apply information. In English reading, learners will encounter various types of information.

Firstly, in the stage of perceiving or inputting information, learners need to improve the automation of vocabulary recognition and reduce the attention occupied by the decoding process, such as achieving an automatic recognition level for high-frequency words. In addition, when we encounter unfamiliar words, the most ideal method is to guess their meaning from the context. But sometimes when it is difficult, it is recommended that readers skip it directly. Because if this new word is important, it will appear multiple times in the article and have multiple synonyms, making it easier for readers to understand; If this word is not important and does not affect the understanding of the main idea of the article, it can be skipped to save reading time. Furthermore, teachers should also introduce some knowledge of word formation appropriately to facilitate learners to increase and expand their vocabulary.

Secondly, in the encoding stage, reading is not only about recognizing vocabulary, but also requires the integration of meaning. In the teaching of reading, teachers should consciously strengthen the vertical and horizontal connection between knowledge and highlight the learning of meaning. And teachers should cultivate students' ability to fully utilize the questions. Teachers should guide learners to be good at analyzing question stems and using them to understand the content of the article. Students are encouraged to firstly read through the questions and highlight repeated keywords, which can roughly help them infer the topic and main content of the article. In addition, learners can also quickly locate the original text and carefully analyze it through the question stem based on the principle of consistent question order with the original text order. In most cases, by doing this students can choose the correct option.

The third strategy, although not commonly used in formal exams, is also an efficient way to process textual information in daily life. That is the transition device, which converts textual information into other forms of information, such as charts, tables, mind maps, etc., to facilitate the organization of the article's main structure and main content. This strategy appropriately increases the germane cognitive load on learners, which is beneficial for them to better grasp the content of the article.

In short, due to the limitation of working memory, it is required to reduce irrelevant cognitive load during reading. The efficiency of English reading depends on the rational allocation of cognitive resources, which requires learners and teachers to strategically process the information in the text.

5.4. Schema Automation Strategy

Schema is the smallest unit of cognitive structure. In English reading, schemas can be divided into language schemas, content schemas, and formal schemas. This section will mainly explore the automation of language schemas. On one hand, it is believed that every word in reading can be seen as a schema. Therefore, the schema automation strategy can be initially understood as learners continuously accumulating sight vocabulary, that is, vocabulary that can be quickly recognized and identified by learners without the need for special efforts. On the other hand, a grammar can also be regarded as a type of schematic knowledge, such as the virtual conditional.

The key to accumulating such sight vocabulary and achieving an automated effect lies in repetition. A word may only be remembered by learners or learners achieve automatic word recognition after it is repeated multiple times in diverse textual contexts. Therefore, learners are required to increase their reading volume while paying attention to the appearance of high-frequency words related to the syllabus, and record them in their notebooks for thorough reading and accumulation. After all, fluent reading requires sufficient sight vocabulary.

However, sometimes schema automation may also generate some issues. In English reading, learners are required to not only remember one common and specific meaning of a word, but also understand some special meanings and usages of the word, otherwise misunderstandings may occur, which will affect reading.

5.5. Schema Construction Strategy

This section will mainly focus on content schema and formal schema, which are the prior knowledge or cognitive frameworks in the human brain regarding the theme, background, structure, etc. of reading texts. Schema construction is the process of activating, supplementing, and reorganizing existing knowledge to help learners understand new information. Here are some feasible reading strategies.

Firstly, in English reading, learners are encouraged to firstly read the questions, try their best to build a logical framework, and then read the original text. The question stem usually contains words that are repeated twice or more, which are usually related to the topic of the article. These words can activate readers' relevant knowledge and help them predict the content of the article.

Secondly, extensive reading is necessary as it can help learners accumulate a wealth of knowledge, enabling them to connect with old knowledge when encountering new topics and content, and aiding in their understanding of the new content. Narrow reading is also effective. It refers to learners engaging in concentrated reading within a specific topic, genre, or author's scope, rather than extensively exploring texts from different fields. The core concept is to reduce cognitive load and improve language learning efficiency through repeated exposure to similar language structures and background knowledge.

Thirdly, there is a linkage mechanism between schema construction and interdisciplinary teaching. The core of schema theory is the integration and transfer of knowledge structures, and the essence of interdisciplinary teaching is to break down disciplinary barriers and establish knowledge networks. Consequently, the combination of the two can significantly enhance students' comprehensive cognitive abilities and avoid knowledge fragmentation. This requires learners to cultivate interdisciplinary thinking patterns, for which teachers can design activities to mobilize students' application of multidisciplinary knowledge, achieving a leap from learning knowledge to using knowledge to solve complex problems.

In short, teachers should be good at inspiring and constructing students' schema knowledge, so that students can understand texts more efficiently, while cultivating critical thinking and cross-cultural communication skills. With the help of accurate learner analysis, teachers can perform better in the subsequent teaching procedures by making full use of students' existing knowledge and experience.

6. Conclusion

This study analyzes the impact of three types of cognitive load on senior high school students' English reading and proposing five concrete strategies—time allocation, attention management, information processing, schema automation, and schema construction—to reduce cognitive load and enhance learning efficiency. The integration of teaching cases further strengthens the applicability of these strategies, offering valuable insights for both teachers and learners.

Nevertheless, the study still has some limitations. While grounded in cognitive load theory, it does not exhaustively explore all its dimensions. Furthermore, the proposed strategies require empirical validation through systematic implementation and assessment in real classroom contexts. Future research should incorporate classroom experiments and in-depth interviews with teachers and students to verify and refine these findings, thereby providing more robust evidence for the conclusions drawn.

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