Application of Thinking Visualization in English Reading Teaching in Senior High School from the Perspective of Activity-based Approach to English Learning

Jia You

School of Foreign Studies, Anhui Normal University, Wuhu, 241000, Anhui, China

Abstract: Reading is an activity of interaction between language and thinking, and in the field of English teaching, cultivating students' thinking ability has become an important research topic. Thinking visualization means that in the learning process, students can show the inner thinking structure and thinking path in a visual way. The use of thinking visualization tools in high school English teaching helps students quickly build a systematic and complete knowledge structure, which has a significant impact on improving learning efficiency and shaping thinking quality. Based on the activity-based approach to English learning, this paper analyzes the innovative path of integrating thinking visualization into high school English reading teaching, aiming at exploring effective strategies to promote the synergistic development of students' comprehensive language ability and thinking ability.

1. Introduction

General Senior High School English Curriculum Standards (2017 edition, 2020 revision) clearly states that the English Core Competencies include four dimensions: language ability, cultural awareness, thinking quality and learning ability. Among them, thinking quality is explicitly included in the framework of the Core Competencies of the English subject for the first time, with special emphasis on logical, critical and innovative thinking. This shift aims to help students enhance ability to analyze and solve problems, make correct value judgments, and lay a solid foundation for lifelong learning and all-round development [1].

Activity-based approach to English learning is one of the core concepts in the new Curriculum Standards, which emphasizes that a series of English learning activities embodying the characteristics of comprehensiveness, relevance and practicability. It lies in three levels: learn and understand, apply and practise, transfer and innovate. The discourse analysis under its guidance is also divided into three levels: discourse-based analysis, in-depth discourse analysis and beyond the discourse analysis. Led by the thematic context, it is used to help students enhance language skills, understand cultural connotations, and develop diversified thinking [1].

Reading teaching is a key way to cultivate students' thinking quality, and it is also an indispensable part of high school English teaching. However, in the actual reading teaching, most students are satisfied with the accumulation of vocabulary and grammar and avoid the difficult thinking training

activities, which limits the development of students' thinking quality and reading ability. The main reason for this is that teachers' interpretation of the text lacks in-depth analysis, and the design of activities lacks pertinence and logic. Therefore, this study tries to use the thinking visualization tool to integrate language, content and thinking in the discourse, and guide students to actively construct a structured knowledge network. In this way, students can not only understand the surface content of the discourse, but also dig deeper into its inherent educational meaning, thus developing multiple thinking skills and problem-solving abilities.

2. Meaning and significance of thinking visualization

Thinking visualization refers to the presentation of thinking processes or results in an intuitive and graphic way that facilitates observation, understanding and communication [2]. In the field of education, this concept is usually used to visualize thinking through multimedia tools such as graphics, images, and animations, which transform abstract thinking concepts, logical relationships, and knowledge structures into intuitive visual information [3]. Thinking visualization tools mainly include eight Thinking Maps, Mind Maps and Concept Maps [4]. Thinking visualization teaching is not only in line with the intuitive principle of human cognition, but also can effectively stimulate students' interest in learning and promote their active thinking and exploration, which is of great significance for guiding teaching practice and optimizing teaching design.

2.1 Promote in-depth reading and comprehension skills

Senior high school English reading materials are extensive and linguistically complex, and are often difficult for students to fully grasp the main ideas and details. Thinking visualization tools can help students sort out the structure of the article, clarify the logical relationships, and refine the key information, so as to achieve in-depth reading. Through visualization, students can see the overall framework and details of the article more clearly, and then better understand the content and intention of the article.

2.2 Develop critical thinking and analytical ability

Activity-based approach to English learning emphasizes the cultivation of students' critical thinking skills in authentic contexts. Thinking visualization teaching effectively cultivates students' critical thinking ability and analytical ability by guiding them to construct knowledge networks, analyze textual information and put forward their personal views on their own. During the visualization process, students need to constantly reflect and argue, thus gradually forming an independent, objective and rational way of thinking.

2.3 Stimulate interest and motivation for learning

The traditional English reading teaching mode is often boring, and it is difficult to stimulate students' interest in learning. But thinking visualization teaching makes the learning process more vivid and interesting through diversified visual presentation methods. Students can experience the fun of learning and the sense of achievement of group cooperation in activities such as drawing mind maps and designing concept maps, thus enhancing learning motivation and enthusiasm [5].

2.4 Enhance knowledge integration and cognitive systems

Senior high school English reading teaching not only requires students to master language

knowledge such as vocabulary and grammar, but also requires students to have the ability to integrate information and construct cognitive systems. Thinking visualization teaching promotes the integration of knowledge and the transfer of memory by helping students connect scattered knowledge points to form a complete knowledge network. At the same time, visualization also helps students build a personalized cognitive system, laying a solid foundation for lifelong learning.

3. The implementation path of thinking visualization in senior high School English reading teaching

The reading passage in the following example is taken from the third lesson of the first unit of the first compulsory book of English published by Beijing Normal University Press. The unit is centered on the theme of "life choices", and the main idea is to establish a positive attitude towards life and life choices, which belongs to the thematic context of "man and self". The title of this text is "Your life is what you make it", and it is planned to be taught in two lesson periods. The text tells the story of Zhang Tian, a university graduate who comes to Guizhou alone to teach. In the face of difficult working and living conditions, Zhang Tian rises to the challenge and helps the children make great progress in their studies, as well as helping the villagers to attract investment and gain their favor. Zhang Tian combines his life choices with social dedication, and students can realize his valuable qualities of not being afraid of hardship and perseverance.

For students in Grade 9, the passage is long and difficult for students to grasp the core knowledge in the learning process. Therefore, in the process of teaching, teachers can change the traditional English reading teaching mode and use the thinking visualization tool to carry out high school English reading teaching activities. The teacher combines a series of English learning activities such as learn and understand, apply and practice, transfer and innovate to cultivate students' thinking quality, and designs four teaching objectives.

Get the main idea of the text by predicting and skimming.

Obtain Zhang Tian's reasons to be a volunteer teacher, challenges he met and changes he brought to the school and village by careful reading.

Learn the importance of determination, perseverance and selflessness from Zhang Tian's story.

Make plans for helping children in rural areas by group work.

3.1 Discourse-based thinking visualization activities for learning and understanding

3.1.1 Use Brace Map to gain the structure of the text

Brace Map is a kind of thinking map designed to analyze the components of an object and establish the relationship between the parts [6]. The use of Brace Map in English reading teaching helps students to deeply analyze the content structure of the discourse and clarify the thematic ideas of the discourse (as shown in Figure 1).
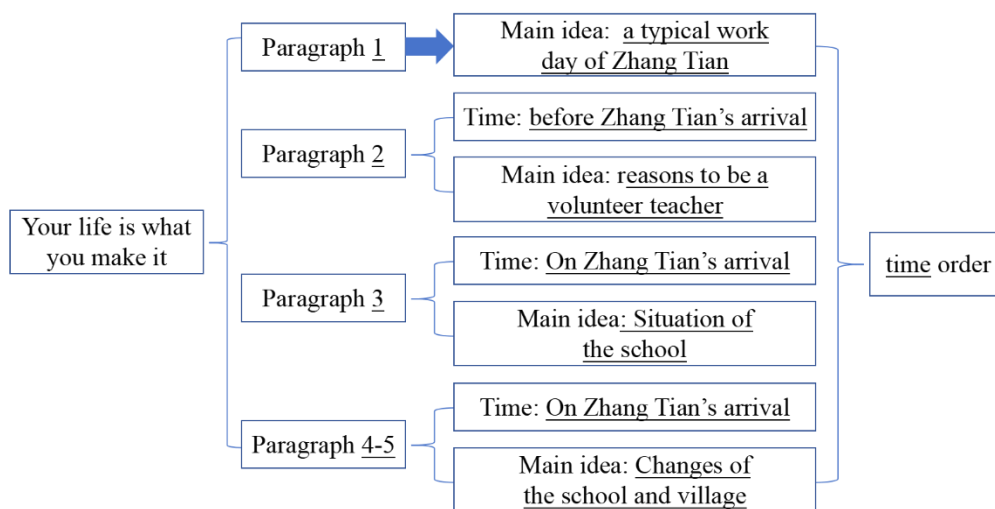
Figure 1 Brace Map

3.1.2 Use T-chart to summarize protagonist's life choices

T-Chart is a two-column information organization chart in which students can record two different aspects of a topic in two separate columns, such as reasons for and against, strengths and weaknesses, as well as facts and opinions, etc. [7] The generation of T-Chart helps students to develop the habit of thinking meticulously, provides authentic contexts for linguistic output, and ensures that the communication has real motivation and value (as shown in Figure 2).

Do	Don't
1. teach in a village in Guizhou Province	1. work in big cities like Beijing and Shanghai
2. stay and overcome challenges	2. disappoint and leave the village
3. stay for another year	3. back to the hometown

Figure 2 T-chart

3.1.3 Use Tree Map to integrate rural changes

Tree Map starts with a core topic and extends multiple branches in all directions, with further subdivisions under each branch into smaller categories or subtopics [8]. This kind of diagram helps to categorize memory and build a structured knowledge system. When using it, the core topic should be identified first, followed by the identification of individual categories and items, and ensuring that parallelism is maintained between items and categories at the same level (as shown in Figure 3).
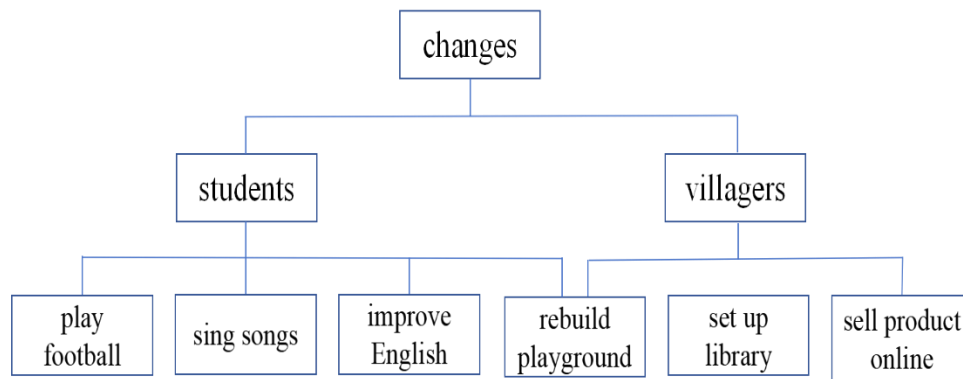
Figure 3 Tree Map

3.2 In-depth discourse thinking visualization activities for applying and practising

3.2.1 Use Line Diagram to analyze protagonist's emotional changes

Line Diagram is a kind of chart that visualizes the trend of data change, which depicts the increase or decrease of values through the rise and fall of the folded lines, and is especially suitable for time-series data [9]. In English reading teaching, we can use line graphs to describe the fluctuation of characters' emotions over time or plot development. This method reflects the interdisciplinary character and helps students understand the emotional levels and psychological changes of characters in the text more deeply through an innovative way (as shown in Figure 4).
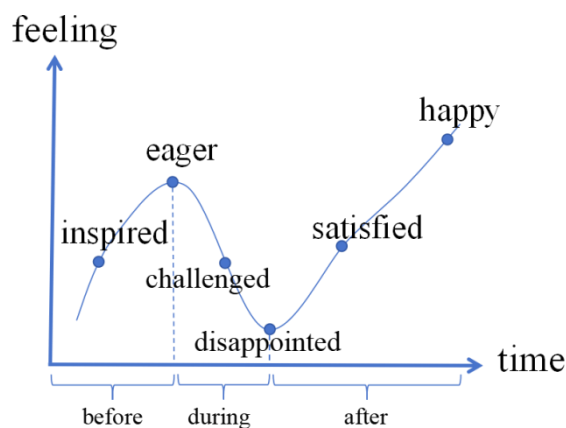

Figure 4 Line diagram

3.2.2 Use Bubble Map to summarize character qualities

Bubble Map is mainly used to depict and analyze the attributes and characteristics of things, which is centered on a topic and extends multiple bubbles outward, each filled with adjectives or descriptive words related to the topic [8]. This kind of illustration can be used in describing the properties of things, comparing the characteristics of different things, and explaining concepts (as shown in Figure 5).
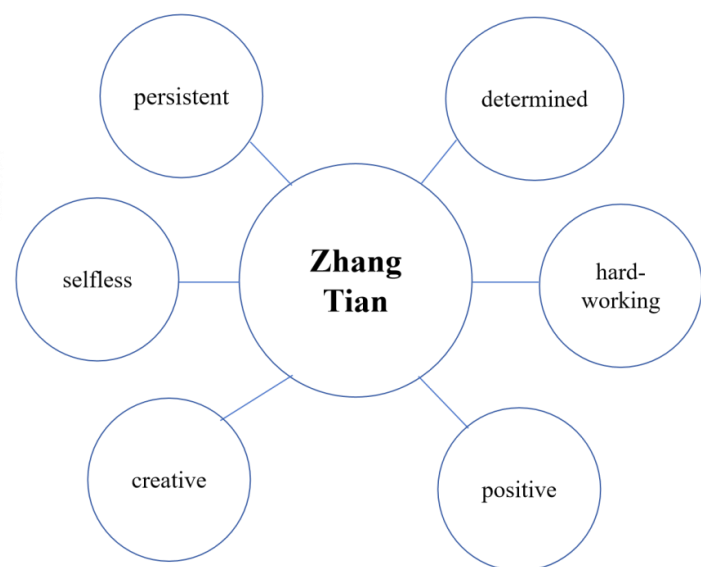
Figure 5 Bubble Map

3.2.3 Use Frayer Model to categorize narrative text characteristics

Frayer Model is a reading model in the form of a quadrangle to clarify, analyze, and explore the meaning, structure, and examples of concepts. Students can use the Frayer Model to deepen their understanding of specific concepts, while teachers can use the model to assess students' mastery of conceptual knowledge. In English reading teaching, the use of Frayer Model helps students optimize the information organization chart of vocabulary learning by placing the vocabulary to be learned at the center and describing it in multiple dimensions, thus making the whole vocabulary learning process more intuitive, logical, and systematic [10] (as shown in Figure 6).

Definition	Characteristics
A narrative essay is an account of an event or a series of events. Narrative writing includes stories, biographies, histories, and news items.	① Chronological Order: The events in a narrative essay are usually presented in chronological order, with a clear beginning, middle, and end. ②Thematic Focus: Narrative essay often explores a theme or moral lesson, which is revealed through the story and its characters. ③ Emotional Appeal: Narrative essay aims to evoke an emotional response from the reader, whether through humor, sadness, excitement or reflection.
Narrative Essay	
Example ①Personal Experience Narratives ②Fictional Narratives ③Historical Narratives	The differences among four types of essays ①A narrative essay is a story with a beginning, middle, and end. ②An expository essay is factual, giving information on a subject. ③A descriptive essay describes a subject and lists interesting details. ④An argumentative essay aims to convince the reader.

Figure 6 Frayer Model

3.3 Beyond the discourse thinking visualization activities for transferring and innovating

3.3.1 Use information technology to enrich students' thinking experience

Through the above learning activities, students have gained a deep understanding of the story of Zhang Tian and draw inspiration from his life choices. At this time, the teacher should grasp the students' mentality and use information technology tools to transform the static illustration of Zhang Tian into a vivid dynamic video and use multimedia equipment to display it (as shown in Figure 7).

Figure 7 Zhang Tian Video

3.3.2 Use Circle Map to develop rural assistance plan

Circle Map is a tool used to promote association that consists of two concentric circles. The topic is labeled within the smaller circle in the center, while the larger circle on the periphery is used to expand on details or features related to that topic. This mapping method is particularly suitable for deepening the understanding of a topic, stimulating associations or detailed descriptions, and effectively promoting the development of divergent and creative thinking [6] (as shown in Figure 8).
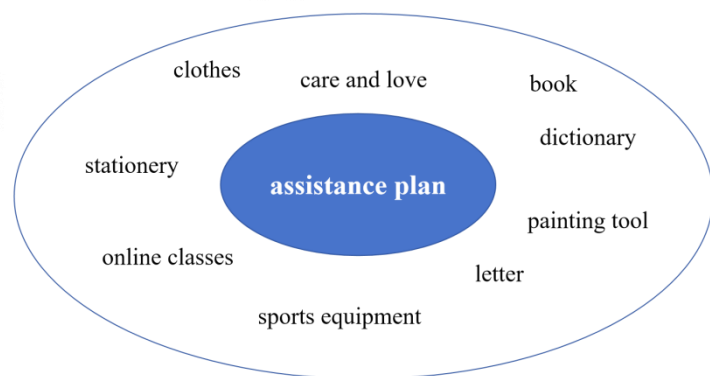

Figure 8 Circle Map

4. Conclusion

Language and thinking are closely related, learning and using language with the help of thinking, and at the same time can promote the development of thinking [11]. In today's education field, with the rapid development of information technology and the continuous innovation of education

concepts, thinking visualization, as an emerging teaching strategy, is gradually becoming an important means to improve the quality of teaching and promote the development of students' thinking. The use of thinking visualization tools from the perspective of activity-based approach to English learning builds an intuitive bridge in high school English reading teaching, making the originally difficult-to-grasp thinking process clearly visible, transforming abstract thinking logic into vivid graphic language, and thus integrating scattered knowledge points into an orderly knowledge network. This innovation not only enhances students' ability to integrate knowledge, but also greatly stimulates their desire to explore knowledge, encourages them to take the initiative to decode and reconstruct information, actively participate in the construction of knowledge, and realize the depth and meaning of learning.

Particularly noteworthy is the fact that thinking visualization tools show great potential for enhancing students' thinking skills. It motivates students to think about problems in a more flexible and innovative way, thus promoting the development of critical thinking, innovative thinking and problem-solving skills. Through continuous practice and reflection, students are able to deepen their understanding of complex issues and develop more comprehensive and profound thinking skills with the help of visualization tools. This finding not only provides strong support for current English reading teaching practices, but also opens up new paths for future education in developing students' comprehensive literacy.

References

[1] Ministry of Education of the People's Republic of China. General Senior High School English Curriculum Standards (2017 edition, 2020 revision) [M]. Beijing: People's Education Press, 2020.

[2] Zhao Guoqing, Huang Ronghuai, Lu Zhijian. Theory and Methods of Knowledge Visualization[J]. Open Education Research, 2005, (01):23-27.

[3] Liu Chuyuan, Lin Shuyang . Exploring the integration of thought visualization and deep learning[J]. China Information Technology Education, 2019,(21):5-8.

[4] Zhao Guoqing, Yang Xuanyang, Xiong Yawen. On the Principles and Focus Points of Teaching Application of Thinking Visualization Tools[J]. Research on Electrochemical Education, 2019, 40(9):59-66, 82.

[5] Zhang Weizhong, Tang Huirong. Five principles of visualization teaching content design[J]. Research on Electrochemical Education, 2010, (10):99-102.

[6] Xing Wenjun. The Practice of Using Thinking Maps to Cultivate Students' Core Competencies in English Discipline in Reading Teaching[J]. Foreign Language Teaching in Primary and Secondary Schools (Middle School Part), 2019, 42(4):23-27.

[7] Zhang Haiyan, Tang Hongyan, Lu Xiangli, et al. A tutorial on the design and practice of secondary English reading teaching [M]. Beijing: Renmin University of China Press, 2021: 74.

[8]Zheng Zexiu. The application of thinking visualization tools in high school English reading and writing [J]. School English, 2024, (16): 51-53.

[9] Si Chengxiang. Application of graphs and tables in data analysis [J]. Secondary Mathematics, 2024, (17):63-64.

[10] Nie Xinlin. The design of English reading teaching activities under the direction of thinking visualization[J]. English Teaching and Research in Primary and Secondary Schools, 2023(3):67-71.

[11] Cheng Xiaotang. The role of English learning in developing students' thinking ability[J]. Curriculum·Teaching materials·Teaching Methods, 2015, 35(6):73-79+127.