ABSTRACT – Critical thinking is an important part of thinking ability. Teachers' questions in English reading classrooms affect the quality of reading teaching and play a key role in cultivating and developing students' critical thinking. There is a certain positive impact on students' critical thinking. However, in the current high school English reading teaching in China, most teachers lack attention to the cognitive level of questioning, and the number of questions with high cognitive level is relatively small. Teachers lack the awareness of using classroom questions to stimulate students' thinking, which is not conducive to cultivating and developing students' critical thinking. (1) How does teacher questioning affect students' critical thinking tendency in high school English reading teaching? (2) How does teacher questioning affect students' critical thinking skills in high school English reading teaching? (3) What is the impact of teachers' questions on students' English reading performance in high school English reading teaching? In response to these problems, this study classifies and designs teacher questions based on Bloom's cognitive target classification, and applies teacher questions to English reading teaching based on constructivism theory and zone of proximal development theory. Using empirical research methods to explore the impact of teacher questioning on students' critical thinking and the effectiveness of cultivating students' critical thinking in high school English reading teaching, with a view to the design of questions in front-line English teachers' reading teaching and the cultivation of students' critical thinking for reference.

INTRODUCTION

The "General High School English Curriculum Standards (2017 Edition)" proposes a core literacy framework for English subjects consisting of four elements: language ability, cultural awareness, thinking quality, and learning ability, and will cultivate and develop the skills that students should have after receiving high school English education. Core literacy is a specific goal of the English curriculum. The quality of thinking reflects the mental characteristics of the core literacy of English subjects. The cultivation of critical thinking, which forms an important part, plays a key role in developing students' core literacy.

Since the promulgation of this document, the thinking ability of middle school students has been widely concerned by the English teaching community, and teachers have begun to attach importance to cultivating the critical thinking of middle school students in English reading classes. Teachers' questioning in English reading classrooms affects the quality of reading teaching and plays a key role in cultivating and developing students' critical thinking. In particular, questioning at a high cognitive level has a certain positive impact on students' critical thinking. However, in China's current high school English reading teaching, most teachers lack attention to the cognitive level of questioning, which leads to the fact that teachers in reading teaching mostly ask questions of low cognitive level, while high cognitive There are fewer questions for the level. Teachers lack the awareness of using classroom questions to stimulate students' thinking, which is not conducive to cultivating and developing students' critical thinking.

In view of this, this study classifies and designs teachers' questions based on Bloom's cognitive goal classification theory, zone of proximal development and constructivism and applies them to English
reading teaching in experimental classes. It is expected to answer the questions through empirical research. The following three research questions are: (1) What is the impact of teachers' questioning on students' critical thinking tendency in English reading teaching in high school? (2) How does teacher questioning affect students' critical thinking skills in English reading teaching in high school? (3) What is the impact of teachers' questions on students' English reading performance in high school English reading teaching? By answering research questions, this paper explores the effectiveness of teachers' questioning in cultivating students' critical thinking and improving students' English reading performance in reading teaching.

This study is based on Bloom's cognitive target classification theory, zone of proximal development theory, and constructivism theory. It can also provide ideas for the design of questions in reading teaching and the teaching of critical thinking for front-line English teachers. In addition, the cultivation of students' critical thinking can help students keep their heads clear when faced with numerous information and opinions in their study and life, and use a critical eye to think, analyse and judge the problems they encounter, which is conducive to Students engage in self-reflection and self-calibration, focusing on the achievement of personal values and goals.

PROBLEM STATEMENT

With the development of society and the reform of new curricula, critical thinking has become the focus of talent training in China. In view of the inseparable relationship between thinking and language, reading, as one of the basic skills of English language learning and an important form of language input, can not only enhance students' sense of the English language but also cultivate students' problem-solving ability. Therefore, in the process of cultivating students' critical thinking, reading teaching plays an important role in language learning. This study takes senior high school students as the research object, Classifying and designing teachers' questions according to Bloom's classification of cognitive goals and based on constructivist theory and recent development zone theory; this paper aims to cultivate and develop students' critical thinking through critical thinking-based English reading teaching.

The purpose of this paper is to implement the following questions:

(1) How does teacher questioning affect students' critical thinking tendencies in high school English reading teaching? (2) How does teacher questioning affect students' critical thinking skills in high school English reading teaching? (3) What is the impact of teachers' questions on students' English reading performance in high school English reading teaching?

There is a correlation between critical thinking and different types of reading. By cultivating students' critical thinking ability and critical thinking tendency, students' reading comprehension can be improved.

Kress (1985) believed that speculative thinking should be infused into the whole interactive process of English reading to prevent cultural invasion from having a subtle influence on second language learners. Paul (2010) pointed out that, in contrast to rote memorisation or simple information recall, the goal of critical thinking is to stimulate the analytical and evaluation process of thinking. Fahim (2010) conducted a study to find out if there was a statistically significant correlation between test-takers' critical thinking skills and their performance in the TOEFL reading section.

LITERATURE REVIEW

An Overview of Literature Review

The study of critical thinking has a long history, starting from the beginning to the middle of the 20th century, and has since gone through many stages of development and enrichment. At first, researchers mostly analysed and judged the research from the skill level, and then gradually grew and developed, and many scholars continued to enrich the connotation and significance of the research from different aspects.
With the in-depth development of theoretical inquiry related to critical thinking, a large number of scholars and experts have tried to introduce critical thinking training strategies into classroom teaching, especially reading teaching, so as to cultivate students' abilities. Bosley (2008) believes that high school students lack active reading in the reading process and rarely use critical thinking, so teachers should pay attention to guiding students to use critical thinking in a timely manner and improve students' reading skills and critical thinking while imparting knowledge.

**Analytical Features of a Literature Review**

Critical thinking can first be seen in the writings and discourses of the ancient Greek philosopher Socrates. Socrates debates and analyses problems, which is to use the "midwifery" similar to critical thinking, and gradually analyses the essence of the problem in a question-and-answer manner. In addition, Dewey, known as one of the pioneers of the study of critical thinking, proposed reflective thinking, and Dewey's "reflective thinking" was the direct source of critical thinking.

In recent years, he has also conducted multi-angle and multi-level analysis research on critical thinking. Huang Congcong proposed five questioning strategies to promote the cultivation of critical thinking ability through empirical research (2019). Li Hongji proved through action research that English reading teaching can effectively cultivate students' critical thinking ability and the positive effect of the cultivation of critical thinking ability on students' reading ability (2020). Existing theoretical research and teaching practice research on the cultivation of critical thinking confirm that cultivating critical thinking ability in reading teaching is conducive to reading comprehension. However, to cultivate students' critical thinking ability in combination with the characteristics of English learning, researchers and front-line teachers should consider how to effectively develop students' thinking in combination with the characteristics of English subjects in English teaching (Cheng Xiaotang, 2015). Gamble (2014) found that the cultivation of critical thinking was superior to face-to-face teaching in online teaching, and students were more active and motivated to answer questions. Murphy (2014) argues that collaborative discussions among students can also be effective in stimulating critical thinking.

In combining critical thinking training strategies with classroom instruction, Syahfirti et al. (2019) measured and developed the critical thinking tendency test in biology through the critical thinking tendency, as an alternative tool to examine the degree of a person's critical thinking tendency, especially in the University of Biology. All of the above measurement studies show a positive tendency, and these results have an extremely important influence on the present and future research and development of critical thinking ability, which also provides a certain theoretical basis for this study. Bosley (2008) believes that high school students lack active reading in the reading process and rarely use critical thinking, so teachers should pay attention to guiding students to use critical thinking in a timely manner and improve students' reading skills and critical thinking while imparting knowledge.

As the cultivation of critical thinking skills has become more and more important in the education community, many scholars have begun to explore how to introduce it into the English reading classroom in secondary schools. Some scholars have explored the teaching of reading based on critical thinking cultivation from the practical level, providing specific and feasible references for teachers' practical teaching. Paul (1990) designed the classroom teaching manual, which elaborates on how teachers should design teaching activities to achieve the purpose of cultivating students' critical thinking and provides a reference for teachers' actual teaching. Shigeo Kato (2012) conducted research in the actual classroom, arguing that teachers should give students more opportunities to express themselves, and proposed a series of step-by-step reading skills that have practical guiding significance for the teaching of reading based on critical thinking.

For example, Kong Lingcui (2001) advocated that the cultivation of critical thinking ability should be combined with other abilities for collaborative cultivation. Tang Guangjie (2009) believed that the training of critical thinking in reading should follow a certain order, and Huang Huiyan (2019) first explored the reasons for the lack of critical thinking ability of junior and senior high school students. Demonstrate that strategies for independent and cooperative learning in English reading teaching classrooms are effective for students' critical thinking development.
METHODOLOGY

This study classifies and designs teachers’ questions based on Bloom’s cognitive goal classification theory, zone of proximal development and constructivism and applies them to English reading teaching in experimental classes. Based on the needs of this experiment and the situation of students, the author selected the California Critical Thinking Skills Test Table 2000 Chinese Edition (hereinafter referred to as CCTST 2000), which aims to investigate the status quo of critical thinking of students and the changes of students’ critical thinking after the training of critical thinking skills in English reading class. This paper explores the effectiveness of teachers’ questioning in cultivating students’ critical thinking and improving students' English reading performance in reading teaching.

CCTST 2000 is a multiple-choice test scale that includes the six core skills of critical thinking, namely analysis, interpretation, self-calibration, reasoning, illustration, and evaluation. According to the manual, the 34 items can be divided into three subscales: analysis, reasoning, and evaluation, which together measure the six core skills outlined in Foschvin's concept of critical thinking.

Research Design

This research uses teaching experiments and interview outlines as research tools, uses SPSS26.0 software to quantitatively analyse the data collected from the reading test papers, and qualitatively analyses the interview content in order to combine quantitative research with qualitative research. The effect of the teaching experiment is analysed as a whole from different aspects.

Population and Sampling

The research subjects of this study were selected from a key high school in Nanyang City, Henan Province. They were students in two parallel classes, Senior Two (1) and Senior Two (2). The author randomly divided the two classes into an experimental class and a control class, with a total of 94 students. Among them, the senior sophomore (1) class is the control class with a total of 49 students, and the senior sophomore (2) class is the experimental class with a total of 45 students. In English reading teaching, the author designs the questions asked by teachers in the experimental class, mainly designing the types of teachers’ questions, including the cognitive level and proportion of the questions asked. For one semester, a total of four months. In the teaching experiment, two English reading test papers were used in this study. The students in the experimental class and the control class were tested in English before and after the experiment, and SPSS software was used to compare and analyse the results of the pre-test and the post-test. Understand the changes in students' English reading scores before and after the experiment.

At the end of the teaching experiment, the author used the interview outline to conduct interviews with the students in the experimental class to understand the experimental class's views and attitudes towards teachers’ questions during the teaching experiment, as well as the changes in students' critical thinking. The interview subjects were randomly selected from the experimental class, with a total of 10 students. The interview outline mainly includes students' understanding of teachers' questions in experimental teaching and the influence of teachers' questions on students' critical thinking.

Data Collection

The English class hours and teaching content of the experimental class and the control class are the same. In English reading teaching, the researchers designed the questions asked by teachers in the experimental class, mainly designing the types of teachers' questions, including the cognitive level and proportion of the questions asked.

In this study, the author classified the teacher's questions in the English reading teaching process according to Bloom's cognitive target classification system (see Table 3.4 for details) and used this as the basis for the teacher's question design in the experimental process.
<table>
<thead>
<tr>
<th>Bloom’s taxonomy (Bloom, 1956)</th>
<th>Keywords</th>
<th>Intention/Application</th>
<th>Question example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>tell, list, identify, name, recall, recite, point out, label, remember, recognise</td>
<td>To tell from experienced knowledge or memory.</td>
<td>What? Who? When? Can you list the time of the story? Can you recall what the passage said?</td>
</tr>
<tr>
<td>Comprehension</td>
<td>indicate, illustrate, summarise, outline, explain, define, state, interpret, describe, retell</td>
<td>To illustrate a subject matter, abstract the main idea of Presenting information, and classify subjects according to concepts or principles.</td>
<td>What’s the main idea of the story? Can you interpret it in your own words? What are the main differences between A and B?</td>
</tr>
<tr>
<td>Application</td>
<td>demonstrate, how, apply, illustrate, how, use, exemplify, practice, classify</td>
<td>To deal with concrete problems by using the learned methods and theories in practical situations. To divide a concrete thing or concept into component parts and find out the mutual relations among its essential attributes.</td>
<td>What will you do to use solar energy? Is it right to judge a person from...? Can you illustrate...?</td>
</tr>
<tr>
<td>Analysis</td>
<td>analyse, deduce, distinguish, separate, plan, chart, classify, contrast, compare, differentiate, test, categorise, infer</td>
<td>To distinguish how the whole elements interact to form a system.</td>
<td>What does the writer mean by saying ...? Was it a challenge? People to...? Can you infer...? What do you find...?</td>
</tr>
<tr>
<td>Synthesis</td>
<td>compose, categorise, compile, reorganise, rearrange, devise, design, summarise, rewrite, combine, hypothesis</td>
<td>To make or develop a plan and operational procedures based on the learned knowledge.</td>
<td>Can you summarise it on...? What are the possible solutions to these problems? Can you compile the comments ...? Were you satisfied with the final product? Does the story show unique opinions? Did your group work well together?</td>
</tr>
<tr>
<td>Evaluation</td>
<td>evaluate, defend, dispute, judge, verify, comment, prove</td>
<td>To examine evidence and make reasonable judgments based on certain/rational criteria.</td>
<td></td>
</tr>
</tbody>
</table>

**Measurement/Trustworthiness**

In the experimental class, the author designed the questions asked by the English reading teaching teachers, emphasising the thinking content of the questioning and paying attention to the cognitive level and proportion of the questioning. Freiberg's (1987) research on the cognitive level of classroom problems found that the ratio of low-cognitive level and high-cognitive level questions is 70%: 30%, or 60%: 40%, is the most able to stimulate students' critical thinking and cognition The proportion of problems in development (Yang Lifang, 2015). Therefore, in the experimental teaching process of this study, according to Freiberg's research, the author used a ratio of 60% to 40% for the proportion of questions asked by teachers on the cognitive level. The English reading teaching in the experimental class is divided into three teaching stages: before reading, during reading and after reading.
In the pre-reading stage, the author activates the students' existing knowledge by showing the subject pictures related to the discourse background and using the knowledge and comprehension teachers with low cognitive levels to ask questions to activate the students' existing knowledge in order to arouse the students' interest in learning. The writing background of the discourse, in order to focus on the theme of this lesson and help students understand the title of the unit, paves the way for students to read and understand the discourse in the next step: in the middle reading stage, the author firstly conducts low-cognition on knowledge and comprehension for students Questions at different levels guide students to accurately find out specific information from the text, and lay the foundation for students to accurately understand the text in the next step. Afterwards, the teacher guides the students to understand the information given in the article gradually and in-depth by asking high-level cognitive questions to the students and analysing and summarising it so as to cultivate the students' abilities of analysis, summary and interpretation. In the post-reading stage, the author mainly designs questions at a high cognitive level, allowing students to express their views on the basis of analysing and judging text information so as to guide students to distinguish different views, process and interpret them.

To solve real-life problems, infer and evaluate the implied meaning and stylistic and rhetorical characteristics that the author wants to express, and then cultivate students' critical thinking. In the specific teaching case, the author designed a total of six types of teacher questions, and the ratio of low-cognitive level and high-cognitive level questions was 59.3%: 40.7%, basically in line with the low-cognitive level and high-cognitive level obtained by the Freiberg study. The proportion of questions asked at the knowledge level is 60%: 40%. Among them, the author focuses on designing problems with high cognitive levels of analysis, synthesis and evaluation that help to cultivate and develop students' critical thinking.

After the experiment, the author conducted an English reading test on the students of the two classes, again took the results of the two classes' reading test as the post-test data and used SPSS software to compare and analyse the results of the pre-test and post-test, so as to observe the experiment. Whether there is a significant difference in the critical thinking and English reading scores of the students in the class and the control class after the teaching experiment, and some students from the experimental class conduct interviews to understand the students' understanding of teachers' questions in experimental teaching and the changes in students' critical thinking.

RESULTS

(1) High school English reading teachers' questions have a positive impact on students' critical thinking tendencies. First, after the teaching experiment, the English reading scores of the students in the experimental class were also significantly improved compared with those in the control class. At the same time, the results of the interviews with the students in the experimental class also show that experimental teaching helps the students to form a critical thinking temperament, that is, the critical thinking tendency. Therefore, through a comprehensive analysis, it can be concluded that teachers' questioning in senior high school English reading teaching has a positive impact on the overall tendency and each dimension of students' critical thinking, and designing teachers' questions can promote the development of students' critical thinking tendencies.

(2) High school English reading teachers' questions have a positive impact on students' critical thinking skills. After the teaching experiment, compared with the control class, the critical thinking skills of the students in the experimental class have been significantly improved in the three core sub-dimensions of analysis, reasoning and evaluation, but they have not achieved the leap between levels. Through the analysis of the results of the student interviews, it can also be found that the critical thinking skills of the students in the experimental class have improved after the teaching experiment.

(3) High school English reading teachers' questions have a positive impact on students' English reading performance. Comparing the pre-and post-test data of reading scores, it can be found that the average score of students in the experimental class in English reading has increased by 7.50 points compared with that before the experiment, and there is a statistically significant difference between the two scores (t=7.393, P=0.000 < 0.05), at the same time, the scores of detailed comprehension questions, reasoning and judgment questions, word meaning guessing questions and main idea questions were
significantly improved compared with those before the experiment (P<0.05). Moreover, by comparing and analysing the reading post-test data of the experimental class and the control class, it can be seen that after the teaching experiment, the experimental class's reading test scores were higher than that of the control class, and the English reading scores were improved. P=0.000<0.05). Through comprehensive analysis, it can be concluded that teachers’ questions in high school English reading teaching can positively affect students' English reading scores and the improvement of students' English reading scores can be achieved by designing teachers' questions.

First, from the perspective of total critical thinking skills, in the pre-test, most students are at a good or strong level, but there are still five students at a weak level, accounting for 13.2% of the total number. In the post-test, 84.2% of the students were good, 13.2% of the students were at a strong level, and the number of students at a weak level showed a change from positive to non-positive.

Secondly, from the perspective of analytical skills, 44.7% of the students are in a good state, 55.3% have reached a higher level, the number of students who have reached a higher level has increased by 34.2% compared with the previous test, and no students are at a weak level. From the dimension of reasoning skills, 34.2% of the students reached a higher level, 23.7% higher than the pre-test, and no students were at a lower level. From the perspective of evaluation, most students achieved good (84.2%) and strong (10.5%) levels, and only 5.3% of students in the weak level, 28.9% lower than the previous test. It can be seen that English reading teaching based on the cultivation of critical thinking is conducive to the improvement of students' overall critical thinking skills.

DISCUSSION

The analysis results showed that after four months of experimental teaching, the overall tendency of critical thinking and critical thinking tendency, the overall critical thinking and critical thinking skills of the students in the experimental class were significantly improved compared with the pre-experimental period, and the students in the control class improved significantly. At the same time, the English reading performance of the students in the experimental class was significantly improved compared with that before the experiment, and the students in the control class were significantly improved. Based on the results of student interviews, it can be concluded that teachers’ questions in high school English reading teaching have a positive impact on students' critical thinking tendencies and critical thinking skills and can effectively improve students' English reading performance.

At the same time, the research results also show that after the implementation of the action, students have improved in the total skills of critical thinking and the three sub-scales of analysis, reasoning and evaluation. This is consistent with the results of action research conducted by Su Funyan (2020), whose average score of total skills in the post-test was 2.27 higher than that in the pre-test. The average score of the three skills in the post-test was 0.75, 0.85 and 0.77, higher than that in the pre-test, respectively. In addition, the students performed best on the analysis scale. In CCTST, the analysis includes sub-skills such as classification, decoding, indicating, examining viewpoints, examining arguments and analysing argumentation. These skills emphasise the absorption and sorting of materials, which is the beginning of reading an article and the part that students can easily master. This is in line with Tang Guangjie's (2009) view that the training process of critical thinking in reading should first be the absorption and understanding of materials, then the questioning and evaluation of materials, and finally, the creative output.

Based on the teaching of English reading in high schools, this study explores the impact of teachers' questioning on students' critical thinking and the effectiveness of cultivating students' critical thinking and improving students' English reading performance through empirical research, which can provide ideas for front-line English teachers' reading teaching question design and critical thinking teaching. In addition, the cultivation of students' critical thinking can help students keep a clear head when facing a variety of information and opinions in study and life, think, analyse and judge the problems encountered with a critical eye, and help students carry out self-reflection and self-calibration, and pay attention to the realisation of personal values and goals.
CONCLUSION AND IMPLICATIONS

Teachers' questioning in English reading classrooms affects the quality of reading teaching and plays a key role in cultivating and developing students' critical thinking. In particular, questioning at a high cognitive level has a certain positive impact on students' critical thinking. This research classifies and designs teachers' questions according to Bloom's classification of cognitive goals and applies teacher's questions to English reading teaching based on constructivism theory and zone of proximal development theory. This paper discusses the influence of teachers' questioning on students' critical thinking and the effectiveness of cultivating students' critical thinking in senior high school English reading teaching in order to provide a reference for front-line English teachers' questioning design in reading teaching and the cultivation of students' critical thinking.

Based on the process of experimental teaching and the analysis results of research data, the author draws the following teaching inspirations:

Teachers should make full use of textbooks to strengthen their understanding and in-depth interpretation of textbooks. In teaching, teachers should use teaching materials to effectively implement teaching, improve education and teaching concepts and literacy, and based on the cultivation of students' critical thinking, they should fully analyse and study the teaching materials, understand the context of the unit theme, explore the meaning of the theme, and deeply understand the meaning of the theme. Interpret the text, accurately understand and grasp the connotation of the text, design reading teaching according to the learning situation, establish the relationship and meaning between the text and the students' real life, help students to master the basic language knowledge and language ability, guide students from multiple perspectives Perceive and understand the world, analyse and make value judgments on the basis of questioning and examination of relevant evidence, and then develop students' critical thinking.

The design of teachers' questions should be based on the student's cognitive level and follow the students' cognitive laws. In the English reading class, teachers' teaching should be based on constructivism and zone of proximal development theory to judge the zone of proximal development of students and to provide "scaffolding" for students. In the pre-reading stage, teachers should use low cognitive level questions, such as knowledge and comprehension questions, to help students recall knowledge related to the text, extract and integrate relevant information from the text, and use their existing cognition and experience. Answer questions to build knowledge and provide scaffolding for further in-depth reading. In reading, teachers should combine low-cognitive and high-cognitive questions based on students' understanding of the text, to encourage students to synthesise textual information, infer the author's point of view and attitude, distinguish facts and opinions, demonstrate hypotheses, put Students' personal inner activities establish a connection with the external world, which in turn stimulates students' judgments in terms of values, helps students to analyse and solve problems objectively and comprehensively, and then develops critical thinking. Continue to use high cognitive level questioning in the post-reading stage to encourage students to generate higher-order thinking, allow students to analyse, reason, and evaluate, and continuously reflect, adjust and revise their own opinions by evaluating the author's point of view during the reading process, so as to form a more rational judgment and realise the transformation of knowledge from "input" to "output".

When designing questions, teachers should balance the proportion of high-cognitive and low-cognitive questions. Teachers should pay attention to the characteristics of the cognitive level of questioning and should realise that teachers at different cognitive levels have different roles in cultivating students' critical thinking. In English reading teaching, when teachers design questions, it is necessary to measure the proportion of teachers with high cognitive levels and low cognitive levels asking questions so that teachers' questioning can achieve the best effect on the cultivation of students' critical thinking. Freiberg (1987) found that the proportion of questions that can stimulate students' critical thinking and cognitive development most is the proportion of low-cognitive level and high-cognitive level questions that conforms to "70%: 30%" through the study of the cognitive level of classroom problems, or "60%:40%". Teachers can use this ratio to design teachers' questions.
ACKNOWLEDGEMENT

We would like to thank my supervisor, Lee Keok Cheong City University Malaysia, for her guidance and assistance.

REFERENCES


