

A Study of Cognitive and Meta-cognitive English Reading Strategies of Junior Middle School Students

-- Taking Nanping Middle School in Zhuhai as an Example

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Abstract: The cultivation of middle school students' English reading ability and the application of reading strategies have become really important research topics. Thus, this paper uses CiteSpace to visually analyze literature on cognitive and meta-cognitive English reading strategies in Web of Science Core Collection, and then answers how students in different reading grades use cognitive and meta-cognitive English reading strategies through data analysis. It is ultimately concluded that students with better grades use more cognitive and meta-cognitive English reading strategies, while those with poorer grades use less. In particular, the differences in the use of meta-cognitive reading strategies are more obvious. Therefore, more relevant studies need to be analyzed some common problems of junior middle school students in English reading, so as to help English teachers understand the differences of students' English reading by combining theory and practice, and achieve the purpose of teaching students in accordance with their aptitude.

Keywords: Cognitive strategies, Meta-cognitive strategies, English reading, Junior middle school students.

1. Introduction

Nowadays, English teachers are trying to implement cognitive and meta-cognitive English reading strategies into teaching practice. The researches on these theories are extensive and in-depth. Oxford, O'Malley and Chamot made outstanding contributions to the theories related to cognitive and meta-cognitive strategies in the early years, and later scholars made in-depth research and development or repeated experimental demonstration on the basis of their theories. Compared with previous studies, this paper is not only reflected in helping English teachers to understand the differences of students' English reading combined with theory and practice, but also in analyzing the current research hotspot and future development tendency with quantitative and visual analysis of relevant literature.

The purpose of this paper is to study the differences between cognitive and meta-cognitive English reading strategies used by students in different English reading grades, so as to offer some teaching suggestions for English teachers to improve junior middle school students' English reading ability.

Therefore, English teachers should help students to correctly apply cognitive and meta-cognitive English reading strategies to improve English reading ability.

2. Researches on Cognitive and Meta-cognitive Reading Strategies

For related theories of cognitive and meta-cognitive strategies, different scholars have different viewpoints. In

terms of cognitive strategies, Sheorey and Mokhtari believed that cognitive strategies are the actions and procedures that readers use when working directly with the text [1]. Furthermore, O'Malley and Chamot classified cognitive strategies into rehearsal, organization, inferencing, summarizing, deduction, imagery, transfer and elaboration [2]. As for related theories of meta-cognitive strategies, O'Malley and Chamot proposed that meta-cognitive strategies include thinking about the learning process, planning for learning, monitoring the learning process and self-evaluation after completing the task [3]. In 1990, Oxford stated meta-cognitive reading strategies are actions that go beyond purely cognitive devices and provide readers with a way to coordinate their own reading process [4]. In addition, Anderson supposed that meta-cognitive reading strategies are used by the readers to control their reading [5].

In this study, CiteSpace.5.8.R3 is used to analyze literature on cognitive and meta-cognitive English reading strategies. The data source of literature is Web of Science Core Collection, with "cognitive strateg*" or "meta-cognitive strateg*" or "English reading" as the topics. The period of publication is from 2012 to 2021, and 2540 related articles are retrieved. After selecting Articles and Review Articles, these 458 articles are retained through exclusion.

Next, Web of Science Core Collection search results are imported into CiteSpace. After the above data is removed duplicates, CiteSpace runs and the keywords co-occurrence map of cognitive and meta-cognitive English reading strategies in literature is obtained by drawing and pruning (See Figure 1).

3. Research Methodology

3.1. Research Questions

Taking the third-year middle school students of Nanping Middle School in Zhuhai as an example, these questions will be answered via the questionnaires and the students' journals. Specifically, the research tries to answer the following research questions:

Question 1: How do the junior middle school students in different English reading grades use the cognitive English reading strategies?

Question 2: How do the junior middle school students in different English reading grades use the meta-cognitive English reading strategies?

3.2. Subjects

The subjects participating in the study are 101 the third-year middle school students from Nanping Middle School in Zhuhai, and these students are from Class 7 and Class 8, which are tutored by the same English teacher. The subjects of the questionnaires are 101 students from Class 7 and Class 8, and the subjects of the students' journals are 50 students from Class 8.

3.3. Instruments

3.3.1. The Test

Due to the need of information collection, it is necessary to distinguish students' different English reading levels via the test. This test is a mid-term exam for students, which is given by a junior middle school in Zhuhai.

Since this paper mainly analyzes students' English reading, only the reading scores in the test are selected to distinguish students' English reading levels.

3.3.2. The Questionnaires

In order to investigate the use of junior middle school students' cognitive and meta-cognitive English reading strategies, this paper uses a questionnaire to divide students into different levels of English proficiency, and then surveys from two dimensions, including: the situation of using cognitive and meta-cognitive strategies in English reading.

Besides, the questionnaire is subdivided from these two aspects and carries on the data statistics by using the answer way of "yes" and "no". In addition, the inappropriate items in the questionnaires were predicted and modified via a pilot test. This questionnaire refers to the Questionnaire on meta-cognitive Reading Strategies of Junior Middle School Students from Gong [6] and the Questionnaire on English Reading Strategies from Yin [7]. The following is the content of the questionnaire.

3.3.3. English Reading Strategies Questionnaire

If the information is consistent with your actual situation, please select "Yes", otherwise, select "No".

1. Please choose according to your reading scores in this semester:

①27 points and above ②23-26 ③18-22 ④ Less than 18 points

2. When reading, I will use the non-written materials in the article to understand the reading content, such as illustrations and diagrams.

3. Before reading carefully, I will look for the topic sentence and the main idea.

4. I will skim the article quickly to get the main idea.

5. When skimming an article quickly, I will read the

beginning and end of the article and the topic sentence of the paragraph carefully.

6. When reading, I will clarify the logical relationship between sentences or paragraphs through connectives.

7. When reading, I will use my existing background knowledge to understand the article.

8. When reading, I will ignore unimportant details.

9. When reading, I won't read the article word by word.

10. When reading, I will quickly find relevant information by skipping and ignore irrelevant information.

11. When reading, I will read the article with questions and look for answers.

12. When reading, I will highlight the key points by making marks or underline key words to help me recall details.

13. When I meet a new word, I will stop and look it up in a dictionary or vocabulary list.

14. When I meet a new word while reading, I guess its meaning according to the context.

15. When I encounter a difficult sentence, I will read it over and over again to understand the meaning and then continue reading.

16. When reading, I will skip the sentences I don't understand and continue reading.

17. When reading, I will try to understand the implied meaning of sentences by reasoning.

18. When I encounter sentences with complex structure, such as compound sentences and clauses, I will dissolve them into simple sentences to understand.

19. When reading, I will translate the content of the article into Chinese word by word in my mind while reading it.

20. After reading, I will summarize the article.

21. After reading, I can infer the unstated conclusion from the content of the article.

22. Before reading, I will predict the content of the article according to the structure of the article and the opening sentence of the paragraph.

23. Before reading, I will predict the content of the article according to the title.

24. After the teacher tells me the reading objectives, I will prepare for the reading.

25. I will make my own reading plan, such as reading two short articles every day or finishing a reading in a few minutes.

26. I will choose my own reading materials.

27. I will monitor and adjust my reading speed and reading strategies according to the difficulty of reading materials.

28. I will choose different reading skills according to different purposes, such as skimming and scanning.

29. While reading, I will consciously practice the reading skills I have learned.

30. When reading, prediction of the article will be constantly adjusted as I read the article.

31. During reading, when I am aware of my distraction, I'll remind myself to concentrate.

32. During reading, if there are difficulties in understanding, I will encourage myself to continue reading.

33. After reading, I will check whether the content of the article is consistent with the prediction I made before reading.

34. After reading, I will think about what I have gained.

3.3.4. The Students' Journals

The students' journals are a supplement to the questionnaire, and its effect is to prove the validity of the questionnaire. In order to collect students' more authentic thoughts on English reading strategies, students are asked to answer some more in-depth questions via the students'

journals. The content mainly includes students' thoughts on reading, students' reading habits, students' reflection on the reasons for their strong or weak reading ability and the ways to improve them.

4. Data Analysis and Results Analysis

4.1. The Use of Cognitive Strategies by Students in Different English Reading Grades

Table 1 shows the data of cognitive English reading

strategy questionnaire. These four scores levels, 27 points and above, scores between 23 and 26, scores between 18 and 22, less than 18 points, represent excellent, good, medium and failing respectively. The percentage of the following data refers to the percentage of "yes" selected in the "yes" and "no" options.

Table 1. The use of cognitive English reading strategies of different grades students

| Categories | Sub-categories | Items | Students' English reading levels | | | |
|----------------------------|--------------------------|-------------------------------|----------------------------------|-------|-------|--------|
| | | | A | B | C | D |
| Fast reading strategies | Skimming | 4 | 60% | 63.6% | 73.7% | 72.7% |
| | Scanning | 5 | 60% | 45.5% | 57.9% | 45.5% |
| | | 10 | 100% | 81.8% | 68.4% | 69.7% |
| | | 11 | 100% | 90.9% | 79% | 78.8% |
| | | Average | 86.7% | 72.7% | 68.4% | 64.7% |
| Careful reading strategies | Reasoning | 2 | 80% | 81.8% | 73.7% | 77.3% |
| | | 6 | 80% | 81.8% | 73.7% | 39.4% |
| | | 7 | 100% | 100% | 68.4% | 69.7% |
| | | 15 | 60% | 54.6% | 36.8% | 33.3% |
| | | 17 | 80% | 72.7% | 68.4% | 45.5% |
| | | 21 | 60% | 36.4% | 47.4% | 33.3% |
| | | Average | 76.7% | 71.2% | 61.4% | 49.75% |
| | | Guessing the meaning of words | 13 | 40% | 18.2% | 26.3% |
| | 14 | | 100% | 100% | 89.5% | 63.6% |
| | Average | | 70% | 59.1% | 57.9% | 50% |
| | Applying the theme | 3 | 40% | 36.4% | 47.4% | 51.5% |
| | Dealing with the details | 8 | 100% | 72.7% | 52.6% | 59.1% |
| | | 9 | 100% | 90.9% | 73.7% | 56.1% |
| | | 12 | 100% | 63.6% | 63.2% | 66.7% |
| | | 16 | 60% | 63.6% | 63.2% | 77.3% |
| | | 18 | 20% | 45.5% | 57.9% | 30.3% |
| | | 19 | 60% | 90.9% | 84.2% | 63.6% |
| | | Average | 73.3% | 71.2% | 68.5% | 58.9% |

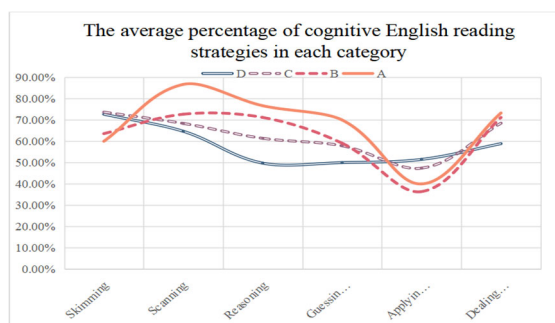
Notes: 1) A= 27 points and above; 2) B= 23-26 points; 3) C= 18-22 points; 4) D= Less than 18 points.

From the Table 1, we can find that reading cognitive strategies in the questionnaire are classified into fast reading strategies and careful reading strategies, with the former divided into skimming and scanning, and the latter divided into reasoning, guessing the meaning of words, applying the theme and dealing with the details.

The first part is fast reading strategies. We can conclude from statistics that the excellent students are more likely to use scanning and the situation of using skimming among the students in the four scores is not significant.

The second part is careful reading strategies. It is found that the higher the students' scores, the better their English reading reasoning ability, and the more likely to guess the meaning of the word and handle the reading details correctly. Besides, the students in the four scores do not often apply the theme and lack the ability to find it in English reading.

In order to display the data more clearly, the average percentage of students in different English reading grades in each category of cognitive English reading strategies from the Table 1 are converted into the Graph 4.1.



Graph 4.1 The use of the average percentage of cognitive English reading strategies in each category

In the Graph 4.1, it is found that students with better English reading scores use cognitive strategies, especially scanning, reasoning and guessing the meaning of words, more frequently than those with worse English reading scores, whereas applying the theme is the opposite. In addition, there is little difference in the frequency of using skimming and dealing with the details among the students in the four scores.

4.2. The Use of Meta-cognitive Strategies by Students in Different English Reading Grades

The Table 2 shows the data of meta-cognitive English

reading strategy questionnaire, and it is also the final data of 101 questionnaires.

From the Table 2, we can find that reading meta-cognitive strategies in the questionnaire are classified into planning strategies, monitoring strategies and evaluation strategies.

Table 2. The use of meta-cognitive English reading strategies of different grades students

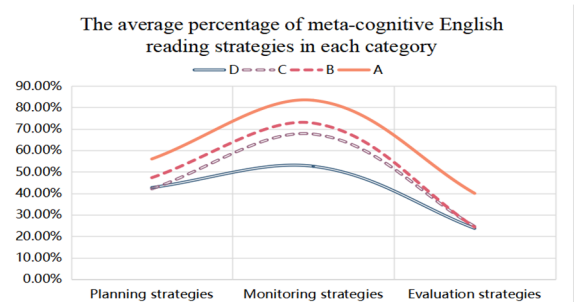
| Categories | Items | Students' English reading levels | | | |
|-----------------------|---------|----------------------------------|-------|-------|-------|
| | | A | B | C | D |
| Planning strategies | 22 | 100% | 81.8% | 52.6% | 43.9% |
| | 23 | 100% | 81.8% | 89.5% | 65.2% |
| | 24 | 40% | 27.3% | 21.1% | 45.5% |
| | 25 | 0.0% | 9.1% | 10.5% | 12.1% |
| | 26 | 40% | 36.4% | 36.8% | 47% |
| | Average | 56% | 47.3% | 42.1% | 42.7% |
| Monitoring strategies | 27 | 60% | 27.3% | 47.4% | 36.4% |
| | 28 | 80% | 72.7% | 63.2% | 54.6% |
| | 29 | 80% | 63.6% | 57.9% | 45.5% |
| | 30 | 80% | 81.8% | 79% | 42.4% |
| | 31 | 100% | 100% | 89.5% | 71.2% |
| | 32 | 100% | 90.9% | 68.4% | 65.2% |
| | Average | 83.3% | 72.7% | 67.6% | 52.6% |
| Evaluation strategies | 20 | 20% | 18.2% | 10.5% | 21.2% |
| | 33 | 80% | 36.4% | 47.4% | 37.9% |
| | 34 | 20% | 18.2% | 15.8% | 12.1% |
| | Average | 40% | 24.3% | 24.6% | 23.7% |

The first part is planning strategies which contain items 22 to 26. It can be seen that when students use planning strategies, they are significantly more likely to predict the content of the English article, and less likely to plan and preview English reading independently. Beside, it can be found that the excellent students use planning strategies more frequently than those in the other three scores, but there is a small difference among the students in the four scores.

The second part is monitoring strategies which include items 27 to 32. It is clearly found that students with higher scores are more flexible to adjust and use reading skills, and they can constantly adjust the prediction of the content as they read the English article, and it is easier for them to monitor attention and perseverance in English reading. However, students are still weak in monitoring and adjusting English reading speed and strategies. Distinctly, the average percentage of monitoring strategies shows that the higher the student's score, the more monitoring strategies are used.

The third part is evaluation strategies which include items 20, 33 and 34. It can be seen that most students rarely summarize the English articles and reflect on the English reading. However, evaluation strategies used by the excellent students is clearly higher than those in the other three scores.

The average percentage of students in different English reading grades in each category of meta-cognitive English reading strategies from the Table 4.2 are turned into the Graph 4.2.



Graph 4.2 The use of the average percentage of meta-cognitive English reading strategies in each category

In the Graph 4.2, the differences of planning strategies, monitoring strategies and evaluation strategies in meta-cognitive English reading strategies employed by students in different grades can be seen clearly. Students with better English reading scores use meta-cognitive strategies more often, especially monitoring strategies. Overall, monitoring strategies are obviously more utilized by students than planning strategies and evaluation strategies.

By comparing the data in the Graph 4.1 and the Graph 4.2, it can be found that on the whole, students with D use meta-cognitive strategies much less than cognitive strategies, while students with A use meta-cognitive strategies much more than cognitive strategies.

In conclusion, students with better grades use more cognitive and meta-cognitive English reading strategies, while those with poorer grades use less, especially the clear difference in meta-cognitive strategies.

4.3. Differences in the Use of Cognitive and Meta-cognitive Strategies among Students in Different English Reading Grades

Using the students' journals to supplement the data demonstration of the questionnaires, students' real thoughts

can further highlight the differences in the use of cognitive and meta-cognitive strategies among students in different English reading grades, so as to answer the above two research questions more clearly.

The following six questions are answered by students in four different English reading levels.

1. Compared with other students in the class, what do you think of your English reading proficiency?

2. Do you like English reading? Do you think English reading is important? Why?

3. Do you set goals for yourself when you are in English reading? Please give an example.

4. Can you adopt different English reading methods or techniques according to different reading purposes and different types of articles? Please give an example.

5. Please briefly summarize the reasons for your strong or weak English reading ability.

6. Do you have any ways to improve your poor English reading ability?

The following conclusions are based on the students' answers to the journals' questions. Students with higher English reading proficiency are more likely to reflect on English reading strategies from the perspective of meta-cognition. In terms of cognitive English reading strategies, students with higher English reading proficiency pay more attention to reasoning, summary and the use of reading skills, while students with low English reading proficiency put more emphasis on the accumulation of vocabulary and the consolidation of grammar. In a word, the former's reflection on cognitive reading strategies tends to be deeper and more logical than the latter, while the latter's reflection is relatively simple and limited.

5. Application of Cognitive and Meta-cognitive English Reading Strategies

According to the analysis of the above questionnaires and students' journals, cognitive and meta-cognitive English reading strategies have a significant impact on students' English proficiency.

As for the cognitive English reading strategies, teachers should teach students some reading skills. For instance, highlighting key words and sentences, looking at the title before reading the article, and skimming the article quickly to

get the general idea of the article.

In terms of the meta-cognitive English reading strategies, teachers can help students make English reading plans and set read goals, instruct students to employ suitable English reading skills according to different situations, and prompt students to concentrate and reflect on English reading in time.

Therefore, the correct application of cognitive and meta-cognitive English reading strategies can improve students' English reading proficiency.

6. Conclusion

This study reveals some common problems of junior middle school students in different English reading grades in the process of reading through data collection and analysis, thus helping English teachers get a deeper understanding of students' English reading differences, so as to help students in different reading grades enhance their reading ability. Therefore, related researches in the future should pay more attention to how teachers apply these reading strategies to English classes.

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