International Journal of Innovation and Research in Educational Sciences
Volume 5, Issue 5, ISSN (Online) : 2349–5219

Research on Teaching Strategies of Junior Middle School Students' Mathematics Reading Based on Deep Learning

Bing Han Zou and YanZhi He
(Department of mathematics, School of science, Yanbian University, Yanji, China, email id: 1402413349@qq.com)
Date of publication (dd/mm/yyyy): 07/10/2018

Abstract **– With the ceaseless deepening of the new curriculum reform, teachers are paying more and more attention to the cultivation of students' independent learning ability. The students' mathematics reading ability is an important guarantee for the improvement of students' autonomous learning ability. Good autonomous learning is not only a process of deep learning but also a meaningful learning. There are several problems of mathematics reading for junior high school students at present, and problems as following: the enthusiasm of student for reading mathematics is not high and motivation is not strong; students lack correct reading methods; teachers do not have enough guidance for students' mathematics reading. The solutions for these problems of mathematical reading strategies based on deep learning include the stimulation of reading interest, the meaningful guidance of teachers, and the guidance of students in the construction of knowledge. All these solutions can ensure the improvement of mathematics reading ability of junior high school students under deep learning and promote the development of students' independent learning ability.**

Keywords **– Deep Learning, Mathematics Reading, Junior High School Students.**

I. Introduction

When making mathematics reading, many students only read the mathematics as a language. They could not grasp the material they read, could not understand the hidden meaning behind it, and could not understand the methods contained therein. Can not have a deeper understanding of the knowledge, so that students are unable to think, and the effect of deep learning is poor. Although most teachers are aware of the particularity of mathematics reading, they have not paid enough attention to it and cannot take effective methods to improve students' mathematics reading.

II. Mathematics Learning and Math Reading

Based on the experimental study of the student's learning process, F. MARTON and R. SALJO published the article "On Qualitative Difference in Learning: Outcome and Process" in 1976, and proposed the concept of deep learning and elaborated it. It is pointed out that deep learning is a process of knowledge transfer, which helps learners improve their problem-solving ability. Deep learning is aimed at students' construction of knowledge, development of practical ability and acquisition of meaning. Chinese scholar Li Jiahou also pointed out in the article "Promoting Students' deep Learning" that deep learning is relative to shallow learning and refers to learning based on understanding [1]. It can be seen that deep learning is an important guarantee for students to learn mathematics knowledge.

Mathematics reading is the learning activity of reading mathematics related content under the guidance of teachers. Students build meaningful learning activities by reading mathematics materials and combining with existing knowledge foundation and experiences [2]. It is an important way for students to actively acquire knowledge and develop mathematical thinking. Understa--nding mathematics language, experiencing the thought methods contained in mathematical materials, and further enhancing mathematics reading ability are of great importance for promoting the depth development of students' mathematical thinking and deep learning of mathematics. The premise of deep learning is that students can successfully perform mathematics reading and have a sense of mathematical materials. Under the deep learning of mathematics reading required students to take initiative reading mathematical information about the material mainly textbooks teaching materials, and make clear the inner meaning of the underlying surface by reading. And at the same time, through reading students can be critically understood and accepted by in-depth thinking to find its connection with the knowledge learned before, and re-establish the construction of the knowledge system.

III. Status Quo of Math Reading of Junior Middle School Students

In order to understand the current situation of math reading of junior middle school students in detail, 122 students in no. 4 middle school in yanji city, jilin province were surveyed and 122 papers were handed out, and 120 valid questionnaires were recovered. The questionnaire mainly reflects the status quo of mathematics reading of junior middle school students through five aspects: the attitude and enthusiasm of junior middle school students towards mathematics reading; problems of middle school students in mathematics reading; the methods used by junior high school students in mathematics reading; Mathematics reading level of junior middle school students; the guidance of teachers. The specific investigation results are shown in table 1- table 3.

Table 1. Survey results of enthusiasm and motivation for junior high school students in mathematics reading.

When do you read mathematics materials	before class	In class	When you have problems after class
percentage	21.7%	31.6%	46.7%
The importance of mathematical materials	A great help	A little help	No help
Percentage	50%	48.3%	1.7%

Table 2. Students' math reading methods and survey results.

Make mistakes without understanding the meaning of the question	Never had	Have been, but rarely	Often	
percentage	1.7%	58.3%	40%	
What part of the content is difficult to read when reading	Mathematical terms, concepts	Mathematical symbolic language	Theorem proving	Examples and problem solving process
percentage	23.3%	38.3%	11.7%	26.7%
Are the methods used to read mathematical and literary materials the same?	Not the same, I have different methods	Same, all use one method	Have no methods	
percentage	40%	45%	15%	
percentage	23.3%	38.3%	11.7%	26.7%

Table 3. Survey results of teachers' mathematics reading guidance.

The teacher will arrange the tasks of mathematics reading.	Always	sometimes will	No task
percentage	20%	58.3%	21.7%
There will be time for reading in class	There will be	sometimes will	No time
percentage	35%	48.3%	16.7%

Table 1 shows that students are not highly motivated to read math and have low motivation. Only 21.7% of the students read math materials actively before class, and nearly half of the students only remembered to read the materials when they encountered problems. Fifty percent of the students realized the importance of reading math materials. This result shows that some students, although aware of the necessity and importance of math reading to their learning of math, fail to keep up with their self-consciousness and are not active enough in acquiring knowledge. They just follow the teacher's steps and ignore the cultivation and improvement of their cognitive ability and learning ability.

Table 2 shows that students lack correct reading methods, resulting in the inability to effectively solve reading difficulties and problems. Students have reading problems in different parts of the math materials. Basically, they have problems due to their inability to understand the meaning of the questions. Even 40% of students often have this situation. And more than half of the students did not have the correct way to read. This result indicates that many students still do not understand the characteristics of mathematics reading, and cannot dig out deeper meaning and thoughts contained therein, and cannot carry on the deep learning. It leads students to interpret the math materials in accordance with the common method of reading literature materials, thus making students unable to understand the questions and extract effective information in the math reading.

Table 3 shows that teachers are not enough to guide students in mathematics. The reading tasks assigned by teachers are not regular, which is not good enough to guide students to read independently, which is not conducive to them to develop the habit of independent reading. Some teachers will leave some time for students to read the textbook in class, but the effect is not achieved. Because junior high school students are in the stage of formal operation, their thinking is transferred from image thinking and abstract thinking to dialectical thinking, but their thinking is still inseparable from perceptual experience. When they suddenly come into contact with abstract knowledge that has been separated from specific situations, they will show certain difficulties, and it is difficult to understand and process. Mathematical reading is easy to stay on the superficial surface, which is not conducive to the development of in-depth mathematical learning. This requires teachers to give them effective reading guidance, guide them to grasp the correct reading methods, and realize the importance of mathematics reading.

IV. Teaching Strategy of Mathematics Reading Based on Deep Learning

A. *Reading Interest Motivation Strategy*

First of all, create a teaching situation that attracts students to read actively. The key to starting math reading is to make students interested in math reading. Teachers' classroom teaching should make timely and correct adjustments based on contemporary education and teaching concepts, and establish an equal and relaxed learning environment. Before the students read, the teacher should appropriately creates some problem situations, which can induce and maintain the students' reading interest. Thinking and answering by showing the phenomenon of conflict with students can also attract students to read actively [3]. It is best to use the topics that

students can see everywhere or experience in person to attract students to read actively, pay attention to the actual problem of teaching situations which be created should be suitable for students to integrate, not too difficult or too easy, to be targeted, inspired and creative. In this way, the vividness, reality and usefulness of mathematics will be perceived by students, thus stimulating students' curiosity and reading interest, which will help students to take the initiative to perform mathematics reading.

Next then, teachers should add meaningful teaching materials. Mathematics has many special characteristics that other disciplines do not have. Therefore, in order to promote the in-depth and meaningful development of students' mathematics learning, it is especially important to cultivate students' mathematics reading ability. Mathematics is composed of mathematical symbols and their various organic combinations, and because of its unique ideological content, abstractness, logicality and other disciplinary characteristics, it is easy to bring a boring feeling to people, and it is difficult to make people interested. The new curriculum standard clearly states that students' mathematics learning content should be realistic, meaningful and challenging. Therefore, mathematics teachers should properly supplement the mathematics learning content with some realistic materials to attract students' attention and stimulate mathematics reading interest [4]. For example, in the intersection line and parallel line section, teachers can insert road maps to attract students' attention and allow students to introduce new content by finding interlaced and parallel roads. Guided by the illustrations to inspire students to be more intuitive, to make students have a deep impression of new knowledge, and to improve students' ability to solve problems.

B. *Meaning Guidance Strategy*

First, infiltrate reading methods through classroom teaching. Learning mathematics concepts, theorems, formulas, and rules is the primary content of learning mathematics. Through the classroom teaching in these aspects, the students' reading ability is subtly cultivated, and students can find the entry point for deep learning. First, guide students through reading. Teachers can draw a reading outline on the overall knowledge and difficulties in this section, so that students can read and think about the textbooks under the guidance [5]. Secondly, the students are instructed to read out the details, and carefully read the descriptions of the reasoning and proofing steps in the mathematics textbooks with high rigor and logic. This requires teachers to properly analyze the teaching materials and guide them in a timely manner in necessary places so that students can understand the knowledge in the textbooks and understand the meaning of their contents. Through taking in the impact of circumstances, the students slowly learn the mathematics reading method. Finally, on the basis of the successful completion of the first two, the mathematics reading content can be gradually enriched according to the cognitive characteris--tics of junior high school students. It can be the material that students are interested in or the mathematics problems raised by the students. Let the students learn independently, and then the knowledge they have learned will be integrated.

Second, develop mathematics reading ability in the pro--cess of solving problems. An important part of mathematics teaching is the application of knowledge, using mathematical knowledge to solve practical problems. Usually this process is mainly based on the explanation of examples and exercises. Teachers should grasp this pivotal moment. In the process of analyzing examples and exercises, students should be taught to read the questions, dig out the deeper meanings contained in the materials, and cultivate students' mathematics reading ability. Teachers should let students develop the habit of diligent thinking, let students learn to deliberate on a question and read in thinking, so as to improve students' reading comprehension ability. Guide students to explore the data, key sentences and types of questions in the title, and compare them with similar situations that have been encountered before, so that when students read the questions, they will reflect the concepts related to them in time. And then construct a preliminary framework to solve the problem. Then they will screen the known conditions of the stem and pay attention to clarifying the relationship between each condition. Finally, summarize the information that has been obtained, and grasp the key data to establish a scientific and reasonable models of solving mathematical problems.

C. *Knowledge Construction Strategy*

Firstly, the teacher should guide the students to ask questions. In the reading of mathematical concepts, teachers can guide students to ask questions. Through the questioning of the knowledge on the textbook concept theorem, students can form the attitude and method of inquiry, so as to help students to understand the nature of the problem through the surface of the problem, help students to transfer knowledge, and enable them to actively construct the knowledge context and knowledge systems suitable for their own learning. So as to achieve deeper learning in mathematics. Through self-questioning of mathematical examples, they can standardize the rigor of their own problem-solving steps and thinking methods. By self-questioning the difficult questions of reading, students can think in the mathematics classroom actively, recognize their own thinking process, and promote the development of students' flexible thinking, thus achieving deep and independent learning.

Secondly, consciously guide students to take notes. Teachers should consciously infiltrate the importance of taking notes on the reading, learning, and thinking in the classroom. In the class, students are given the task of arranging the corresponding summaries for the rest of the time or under the class. The students are set to establish good habits in a subtle way. Over time, they can achieve the purpose of self-organizing knowledge. After refining and categorizing the content of mathematical materials, it is helpful for students to review old knowledge and think about new knowledge, thus enriching and improving their existing knowledge system. For example, after learning the judgment of a completely equal triangle, the method theorem for determining the equality of two triangles can

be generalized. It is not only necessary to sort out what the teacher has taught and what the textbook says. It is also necessary to sort out the difficulty of reading, solve the problem through independent inquiry, cooperative discussion or consultation with teachers, and record the solution together, which is conducive to retrospective thinking and transfer and reconstruction of learning after class.

V. CONCLUSION

Students' mathematical reading ability has a direct impact on the development of their thinking and burst of creativity. Cultivate students' rational reading ability to keep up with the trend of times and satisfy the demand of mathematics education. The improvement of students' mathematical reading ability is conducive to the better development of their deep learning. Mathematics teaching should promote the development of students and guide them to establish the consciousness of independent development. In teaching activities, mathematics teachers should guide students to read mathematics consciously, and provide students with independent reading space as much as possible, so that students can experience, feel and discover in the process of math reading, thus leading the students' mathematics learning to the depths.

REFERENCES

[1] L. He, J.H.Li. "Promoting students' deep learning" Modern Teaching, 2005.
[2] A.Y. Zhong. "Overview of Mathematical Reading Research," Teaching and Management, 2009.
[3] P.C.Li. "The Ways of Cultivating Mathematical Reading Ability of Junior Middle School Students," Educational Science Forum, 2014.
[4] X.K.Li. "Research on the cultivation of mathematics reading ability, "Journal of Mathematics Education, 2004
[5] S.H. Xu, H. Luo. "Experiment and thinking on cultivating students' reading ability in mathematics teaching," Journal of Mathematics Education, 2001.

AUTHORS PROFILE'

Binghan Zou, female, HeBei Province, China, born in April 1995, studying at Yian Bian Univresity, as an postgraduate of Subject teaching (mathematics).

Yanzhi He (1966 -), Jilin Province, China, associate professor, master. Engaged in the research of mathematics curriculum and teaching theory.