



The application of mathematical picture book in the mathematics teaching of the lower grades of primary schools in China

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Abstract

Since the beginning of the 21st century, mathematical picture books have been gradually applied to domestic mathematics teaching, especially in the past decade. With the attempt of mathematical picture books in various parts of China, a series of related researches have emerged. The research not only promoted the integration of mathematics picture books and mathematics teaching in the lower grades of primary schools but also makes the application of mathematics picture books more reasonable and scientific. This paper summarized more than ten years' research on the application of mathematical picture books in the teaching of mathematics in the lower grades of primary schools, so as to provide references for further studies in the future.

Keywords: mathematics picture books, primary school lower grade, mathematics teacher, mathematics learning interest

1. Introduction

Lin Yuting mentioned that "mathematical picture books refer to the fact that the storyline is related to the mathematical content and is closely related" (Lin, Y. T., 2017) ^[1]. Luan Hui and Chen Hui mentioned that "Mathematical picture books are based on children's psychological characteristics, personality characteristics and comprehension skills, combined with rich and vivid story situations and integrated into the most practical mathematical knowledge and mathematical concepts" (Luan, H. & Chen, H., 2017) ^[2]. Mathematical picture books can not only stimulate students' interest in learning mathematics, but also promote the improvement of students' mathematical literacy. In recent years, a series of related researches have emerged in China. In order to better promote the applied research of mathematical picture books in the mathematics teaching in the lower grades of primary schools, this paper intends to review and sort out the relevant researches in recent years, and induct and summarize the results and methods.

2. The application value of mathematical picture books in mathematics teaching of lower grades of primary schools

It is widely believed that mathematical picture books are also an extremely important auxiliary tool for the teaching of mathematics in the lower grades of primary schools, which has a strong application value. Hong Yaoqi and Zhou Qihua mentioned that mathematics pictures help primary school students to make rational mathematics sensible through drawing and text. Through expressive pictures, the fun of mathematics can be perceived by children earlier, with childlikeness and life. The mathematical picture book allows children to learn mathematics lively and interesting, turning boring learning into a life game, allowing students to experience the fun of mathematics (Hong, Y. Q. & Zhou, Q. H., 2016) ^[3].

Taking Ding Yuanyuan as an example, from the three aspects

of "number" to "form", "shape" to "number", "number" and "form", it is infiltrated with the combination of numbers and shapes to enhance students' comprehensive quality of mathematics (Ding, Y. Y., 2018) ^[4]. Shi Dongxia mentioned: Mathematical picture books vividly boring mathematics knowledge with interesting fairy tale plots and intuitive pictures, allowing students to observe in reading, speculating in observation, exploring in speculation, and thus promoting the core of mathematics for students (Shi, D. X., 2016) ^[5].

Li yan proposed that the ingenious use of mathematical picture books in the teaching of mathematical concepts in the lower grades can enable children to have a deeper understanding of concepts in relaxed learning, generate psychological resonance and form inner feelings, so as to truly optimize the cognitive structure of mathematics, develop the ability of mathematics learning and promote the development of mathematics learning (Li, Y., 2018) ^[6].

Liu Jianguan believes that most of the pictures in the picture book are works of professional illustrators. The story is conveyed by drawing. Children enjoy stories in their reading process, and at the same time they also get the edification of beauty (Lin, J. Y., 2015) ^[7]. Zhang Hong believes that the picture book contains rich aesthetic factors. With the help of the picture book, students can perceive the beauty, feel the beauty, appreciate the beauty and create the beauty, thus improving the students' aesthetic ability and creativity (Zhong, H., 2015) ^[8].

Jiang Xiulin mentioned that for primary school students, teachers seems like their second parent, teachers have absolute authority in school, which makes students more restrained in their learning process, thinking can't be fully developed and can't pay full attention to their study. The emergence of mathematics picture books enables teachers to read picture books with students, so that teachers can transfer knowledge in storytelling, which brings the distance between students and teachers closer, so that teachers and students can communicate

well. The emergence of the teaching mode of mathematics picture books has made the relationship between teachers and students more harmonious. Teachers and students have reached the realm of teachers and students in the process of learning. The establishment of this new teacher-student relationship helps students to learn better (Jing, X. L., 2018) ^[9].

3. Defects and shortcomings in the application of mathematical picture books in mathematics teaching in the lower grades of elementary school

3.1 Selection and location of mathematical picture books

Xue Lihua and Shao Dengyu mentioned that the mathematical picture books on the market are mostly compiled by foreign authors. Due to differences in cultural backgrounds, some mathematics picture book's design contents are not suitable for the experience and development needs of students in China, the region, the school and the grade. This has led to difficulties in teachers' selection of mathematics picture book selection, and some teachers have not adopted sufficient selection materials but directly used it (Xue, L. H., 2015; Shao, D. Y., 2015) ^[10-11].

Lu Lihua mentioned that the effect of picture book teaching depends first on the choice of picture book and the positioning of the target. The goal is the soul of the entire teaching activity, which includes the purpose and direction of the teaching activities. In practice, we found that some picture books are difficult to find a completely suitable age group; the goal is high, the student's academic qualifications are not up to the goal, the goal is low, and the students lose the strength of learning (Lu, L. H., 2017) ^[12].

3.2 The degree of combination of mathematical picture books with the existing teaching systems

Lu Lihua mentioned that considering the market sales, mathematical picture books tend to set a relatively broad learning age, resulting in inaccurate target positioning (Lu, L. H., 2017) ^[12]. Shao Jing mentioned that the knowledge points of many mathematical picture books are not systematic. Therefore, whether it is possible to find a suitable mathematical picture book in line with the content and goals of the mathematics classroom needs to be a problem faced by many teachers, so that it is difficult to integrate the mathematical picture book with the mathematics course (Shao, J., 2016) ^[13].

3.3 School support for picture book teaching

Sun tong believes that the picture book as a new curriculum resource has not yet attracted the attention of the school department. Although, the picture book will appear frequently in excellent seminars organized by various departments at all levels. But in the daily teaching activities, It did not receive enough attention from school. The school pays more attention to the utilitarian value of textbooks, while the carriers, such as picture books, which can enhance children's aesthetics, enrich children's emotions and spread children's thinking, have not received enough attention. On a daily basis, the daily teaching and research work of the school will be carried out regularly, but it is limited to traditional lesson preparation, class

evaluation and so on. For picture books, the school will not take the time to specialize in training. Therefore, teachers often teach children according to their previous teaching experience. If the teaching method does not satisfy the children's development, the children will not be touched by the "beauty" in the picture book (Sun, T., 2018) ^[14].

3.4 Design of the teaching structure of picture book

Sun tong believes that the picture book should be the learning carrier for the lower grade students. Teachers should not use it as a tool for easy use, but should be carefully selected as an important supplementary teaching material for talent training. When many teachers choose picture book, they are subjectively strong, or they are not carefully chosen at all. Therefore, the picture books chosen by many teachers are not suitable (Sun, T., 2018) ^[14]. Lu Lihua mentioned that in the teaching of mathematics picture books, some teachers confuse the fun of picture books, and draw pictures for the picture books, thus losing the meaning and value of the essence of teaching. Some teachers pay too much attention to the teaching of knowledge and skills, ignoring the integrity of the storyline of the picture book. So that students do not get emotional satisfaction (Lu, L. H., 2017) ^[12]. Shao Yong mentioned this issue in the article "Preliminary Exploration of Mathematical Picture Book Teaching". An effective mathematics picture book class requires teachers to carefully select the mathematics picture book to match the content and goals of the math class. At the same time, it is necessary to consider effective use and effective teaching design. These are great challenge for teachers' ability and energy challenge (Shao, J., 2016) ^[13].

4. The application strategy of mathematics picture book in mathematics teaching in the lower grades of elementary school

4.1 Carefully screen and select mathematics picture books suitable for lower grade students to give full play to the diversified teaching value of mathematical picture books

Jiang Su believes that mathematics picture book teaching is still in its infancy, and the picture book contains a wealth of mathematics teaching resources, but not all mathematics teaching is suitable for picture book teaching. First of all, we should carry out research on teaching, deepen the excavation, design the scene story according to the teaching objectives and the characteristics of the students' age, so that the picture book can fully exert the diversified teaching value (Jing, S., 2017) ^[15].

4.2 Accurately grasp the core knowledge of mathematics picture books, determine the appropriate teaching objectives and teaching activities

Lu Lihua and Gao Conglin believe that they should study the picture books repeatedly, explore the mathematical elements, and make appropriate adjustments to the content and goals. Organize the storyline under the guidance of the teaching objectives, and integrate the mathematical activities with the contents of the picture books (Lu, L. H., 2017; Gao, C. L., 2015) ^[12, 16].

4.3 In the way of teaching, deal with the relationship between the perception of the picture book and the hands-on operation, pay attention to the accumulation of activity experience and the experience of mathematics perception.

Gao Conglin believes that in the teaching of mathematics picture books, we pay attention to the relevant thoughts of "doing mathematics". According to the specific storyline, we add student operation and role-playing links, strengthen children's personal experience of mathematics picture books, and immerse themselves in the mathematics study of picture books. Further understanding the mathematical content and enhancing the mathematical knowledge contained in the picture book (Gao, C. L., 2015) ^[16].

4.4 Correct handling of books and picture books knowledge

Zhai Jianyao mentioned that through the purposeful selection of picture book stories to reveal the core mathematics knowledge content, it is actively and effectively interspersed into the progress of teaching, thus achieving the close integration of the two and realizing effective links. In addition, on the plot of the low-grade picture books at the present stage, you can make appropriate adjustments, so that students can more clearly understand the connection point between the story and the mathematical knowledge, and through positive creation, obtain the results that are consistent with the goals of mathematics teaching (Zhai, J. Y., 2017) ^[17].

4.5 Improve the professional literacy ability of teachers' picture book guidance

As ni tong mentioned (1) Teachers should have correct guiding ideology, absorb excellent teaching concepts at home and abroad, communicate with students, and combine the actual situation of students to conduct picture book guidance. (2) To improve the ability of teachers to select a picture book. The choice of picture books should respect the individual differences of students and choose a picture book suitable for students in lower grades. (3) The teacher should give a systematic explanation. (4) Give full play to the flexibility of teacher picture book teaching and creative use of picture book activity scenarios. (5) To improve the understanding of teachers' picture books. There are two aspects to improving the teacher's comprehension. One is to understand the content of the picture book, and the other is to understand the students' ideas. Students' understanding of picture books will be different according to their own experiences and experiences, and teachers must have certain tolerance for students to understand differences (Ni, T., 2017) ^[18].

5. Rational review of existing research

In summary, it can be seen that the current research on the application of mathematical picture books in mathematics teaching in the lower grades of primary schools involves three aspects: application value, deficiency and strategy. For the application value of mathematics picture books in mathematics teaching in the lower grades of elementary school, the predecessors' research has given full affirmation, not only pointing out that mathematics picture books can stimulate students' enthusiasm for learning, promote the improvement of students' core literacy, and improve students'

aesthetic ability and creativity. For the defects and inadequacies of the application of mathematical picture books in the elementary school mathematics teaching in the lower grades, the predecessors mainly started with the selection of mathematical picture books, the school's support for picture book teaching and the design of picture book teaching structure. As for the application strategies of mathematical picture books in the teaching of mathematics at the lower grade of primary school, current researchers point out that they should not only carefully screen picture books, pay attention to the accumulation of activity experience, but also improve teachers' professional quality and ability. All these strategies are not unreasonable.

However, it can be seen from the above analysis that although many researchers in China have conducted research on the application of mathematical picture books, they are relatively fragmentary, one-sided and not systematic. Some teachers and scholars realized that they should improve teachers' mathematical draw this guidance ability, but it is also lacking for the problems that teachers have in the application of mathematics picture book teaching, and how to effectively and effectively guide the teacher to apply the mathematics picture book. Therefore, the first-line teachers need to guide the application of the mathematical picture books in teaching specifically and meticulously. Only in this way can mathematical picture books play a greater role in mathematics teaching.

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