

# Research on Promoting Positive Transfer of Mathematics Learning in China

Yueyue Jia, Zezhong Yang\*

The School of Mathematics and Statistics, Shandong Normal University, Jinan, China

## Abstract

The issue that how to promote the positive transfer of mathematics learning has always been the focus of research. This study reviews and summarizes the research on the promotion of positive transfer of mathematics learning in past two decades in China, and draws following conclusions: (1) The teaching suggestions and strategies for promoting the positive transfer of mathematics learning discussed in the previous research mainly focus on six aspects: teaching content, teaching situation, teaching methods and means, cultivation of basic knowledge and ability, learning interest and learning set. (2) Many of aspects has been researched quite in depth and specifically. However, there are some deficiencies, such as the research subject is only limited to teachers, the research method is single, and lack of empirical methods, the research content is limited to the transfer of knowledge and skills and does not involve the transfer of emotion and attitude. There are still blank points on how to promote the positive transfer of mathematics learning based on students' metacognition and teaching evaluation. (3) In consideration of deficiencies of previous research, future research can make breakthroughs in following aspects: The first is to study how to promote the positive transfer of learning from the perspective of students; The second is to study with various empirical methods; The third is to study how to promote the positive transfer of emotion and attitude; The fourth is to study deeply how to promote the positive transfer of mathematics learning based on metacognition and teaching evaluation.

## Keywords

Mathematics Learning, Positive Transfer, Mathematics Knowledge, Generalization Ability, Learning Set

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## 1. Introduction

Transfer of learning refers to the influence of one kind of learning on another. Transfer of learning includes the transfer of knowledge, skills, emotion, attitude, habits, and others. In the learning process of students, the transfer of learning plays a significant role. The education community has also put forward the slogan of “teaching for transfer” [1]. Transfer of learning can not only help students to achieve the effect of “learning from the past”, but also help students to learn and understand new knowledge, enrich their cognitive structure and improve learning efficiency. Transfer of learning can be divided into different categories according to different criteria. Among them, the positive and negative transfer according to

the effect of transfer is the most concerned. The positive transfer refers to the positive influence of one kind of learning on another kind of learning, while the negative transfer refers to the negative influence of one kind of learning on another kind of learning. The purpose of mathematics education is to pursue a positive transfer. That is to say, through the learning method of “inferring other things from one fact”, students can reach the state of “knowing one and knowing ten”, and students' good cognitive structure can be shaped, and then it will reach the state of “teaching is for non-teaching” [2]. Mathematics is a basic subject with high abstraction, strict logic, and wide application. Therefore, the study on how to promote the positive transfer of mathematics learning has not only high theoretical value, but also high practical value. This article reviews and summarizes the research on promoting the

\* Corresponding author

E-mail address: [zhongzee@163.com](mailto:zhongzee@163.com) (Zezhong Yang)

positive transfer of mathematics learning in the past two decades in China, and provides some suggestions for future research.

## 2. Research Method

### 2.1. Source of Data

This article uses the literature method, and all the information of the article comes from CNKI. CNKI is the most authoritative document retrieval tool for national academic journals, covering various fields and types of documents. Research on the data of the database ensures the persuasiveness and reliability of the research.

### 2.2. Data Collection

We firstly uses “promote the positive transfer of mathematics learning” and “promote the mathematical transfer” as search terms, and “theme” as the search item, with the publication time was 2000-2020, while 15 articles and 37 articles are obtained. In order to collect data more comprehensively, 198 articles are obtained with “the mathematics positive transfer” as the search terms, “theme” as the search item and 2000-2020 as the publication time. Taking into account the content of the study and citations of the literature, 36 articles are finally selected.

### 2.3. Data Collation

By taking notes of each document, including the research problems, methods and results, and summarizing all documents, it is found that predecessors put forward teaching suggestions and strategies to promote the positive transfer of mathematics learning on six aspects: teaching content, teaching situation, teaching methods and means, cultivation of basic knowledge and ability, learning interest and learning set.

## 3. Results

### 3.1. Application of Teaching Content

#### 3.1.1. Reasonable Selection, Organization and Application of Teaching Content

Liu, Cui, and Rong point out that in order to effectively promote the transfer of learning, teachers should choose mathematics textbooks with logical content organization for teaching. There are three characteristics of a logical textbook: First, there are the internal relationship and the connection among concepts, among principles and among the front and back of knowledge; Second, the presentation of the textbook follows the order from the general to the individual, and from the whole to the detail; Finally, the organization of the textbook is from the simple to the deep, from the easy to the

difficult, and from the known to the unknown [3]. Chen, Song, and Wu propose that in order to promote the positive transfer of learning, teachers should reasonably organize and arrange teaching contents: The first is to pay attention to the comprehension level of students; The second is to make use of the internal connection of teaching materials; The third is that all elements of teaching contents should be structured and integrated so that students can have a clear knowledge structure [4-6]. Xu, Zhu, and Chen believe that in order to promote the positive transfer of learning, teachers should follow the order of gradual differentiation from the general to the specific, from the whole to the detail when presenting contents of mathematics textbooks [2, 7, 8]. Chen also points out that if some mathematical contents cannot be presented according to the principle of the gradual differentiation, they will also be presented according to the serialization [8]. Wu points out that the basic knowledge (basic concepts, basic principles) and skills of each discipline are widely adaptable and easy to generate transfer. Therefore, in order to promote the positive transfer of learning, teachers should first make use of basic and typical facts in teaching, instead of using special cases at the beginning [6].

#### 3.1.2. Strengthen the Connection Between Knowledge

Chen points out that the scope and the effect of transfer depend on whether there are common factors among objects, and the more there are common factors, the more obvious the effect of transfer is. Therefore, teachers should pay attention to digging common factors of new and old knowledge, so as to simplify knowledge and facilitate transfer of knowledge [4]. Chen also believes that through common elements of old and new knowledge, the interaction between the old and new knowledge (assimilation or adaptation) could be made, and the new knowledge would eventually be absorbed or expanded into the original mathematical cognitive structure of student. Therefore, common elements between the old and the new knowledge should be sought to build the bridge of transfer and promote the occurrence of transfer [8]. Huang points out that the common factor between two kinds of learning materials is an important factor affecting the transfer of mathematics learning [9], Zhang also points that the similarity of new and old knowledge is an important aspect affecting the transfer of learning [10]. Therefore, teachers should organize teaching activities reasonably, pay attention to the connection of the new and old knowledge in each link of teaching, fully consider the existing knowledge of students, use the existing characteristics of knowledge of students to learn new knowledge, make the front knowledge ready for the back knowledge, make the back knowledge become the extension and development of the front knowledge, and promote the realization of positive transfer [9, 10]. Ning

points out that in order to promote the positive transfer of learning, teachers should provide students with guided knowledge before learning new knowledge, with the purpose of providing the connection for new learning content or promoting students to distinguish between new knowledge and old knowledge [11]. Sun points out that in order to effectively promote the formation of positive transfer, first of all, it is necessary to strengthen the relevance between new and old knowledge [12]. Sun believes that in order to promote the positive transfer of learning, teachers should carefully arrange review contents, highlight the internal relationship of knowledge, express or let students explore common elements of new and old knowledge, so as to create conditions for the transfer of new knowledge learning [13]. Li believes that in order to promote the positive transfer of learning, mathematics teachers should strengthen the comparison and generalization between the new and old knowledge of mathematics in teaching practice, so that students can learn from the old, strengthen the connection, improve the comprehension and memory of the new knowledge, and strengthen the transfer from the old knowledge to the new knowledge [14]. Cui and Li put forward two points about promoting students to realize the transfer of the old knowledge to the new knowledge: Firstly, before teaching, teachers should sort out the connection between new and old knowledge of primary mathematics, select the old knowledge with the most points of connection with new knowledge, and initially build a bridge between the new and old knowledge; Secondly, in the process of teaching, teachers should guide students to reveal the connection between new and old knowledge through comparison and other methods, so as to practically build a bridge between the new and old knowledge [15]. In addition to the connection between the new and old knowledge, Xuan points out that in the process of teaching, teachers can connect subjects knowledge and let students form the transfer of subjects knowledge [16].

### 3.2. Creation of Teaching Situation

Chen points out that the learning situation is similar to the actual situation of applying the knowledge in the future, which is helpful to the transfer of learning. Therefore, teachers should try their best to set up a situation that is similar to the actual situation for students [4]. Cui and Li also point out that teachers should not only introduce the favorable situation that is close to cognitive laws of students, but also pay attention to the comprehension of various relationships in situations. And teachers should create favorable situations for understanding and application of knowledge, and promote the transfer of knowledge to application [15]. Tu and Cheng point out that the learning situation is an important aspect of promoting the transfer of

learning, and a single situation is not conducive to the occurrence of transfer of learning. Therefore, Tu and Cheng advocate that students should study in diversified situations, and students study in situations with many relevant information, so that the transfer of learning of students is relatively easy to achieve [17, 18]. Xu points out that the application of mathematical knowledge is the process of transfer of skills. Teachers should create a good transfer situation for students so that knowledge and skills of students can be applied in time to promote the occurrence of transfer [19].

### 3.3. Application of Teaching Methods and Means

#### 3.3.1. The Use of Analogy

Qu points out that the analogy is a way that people base on the fact that some attributes of two objects or two kinds of things are the same or similar to guess that other attributes may be the same or similar. Analogy can be a bridge and link of mathematics learning [20]. Zhu and Zhang also advocate that the new learning or problems should be incorporated into the original cognitive structure by analogy to generate transfer of knowledge [7]. Therefore, Zhu, Zhang, and Qu propose several methods of using analogy to promote transfer: The first is the analogy of mathematics and graphics; The second is the analogy of mathematics and other disciplines; The third is the analogy of conclusions; The fourth is the analogy of methods; The fifth is the analogy between mathematics knowledge, which includes the analogy between discrete and continuous, the analogy between finite and infinite, the analogy between low dimension and high dimension [7, 20]. Zhang and Ma believe that teachers should pay attention to guiding students to use analogy, induction, deduction and other methods to promote the transfer of learning [21, 22]. Chen points out that the analogy is a method often used in primary school mathematics teaching. Teachers should guide students to carry on analogical reasoning and cultivate analogical reasoning ability of students [8]. Xiong, Chen, and Duan believe that the appropriate use of transformation and analogy can well promote the positive transfer of learning. Therefore, in the teaching of the complex variable function of engineering, teachers should emphasize the mathematical thinking method of transformation and analogy, and teachers should give certain learning guidance to learning of complex variable function [23]. Taking specific problems of grade four as examples, Zhang points out that the transfer of problem-solving methods can be realized by mutual analogy [24].

#### 3.3.2. With the Information Technology

Sun and Wei advocate applying the powerful function of

information technology to promote the positive transfer of mathematics learning of student. First of all, by using the powerful performance function of information technology to show mathematical concepts, theorems, axioms, etc in many directions and sides, students can have the full perceptual cognition of knowledge and they will fully understand knowledge. Secondly, the use of information technology allows students to carry out mathematical experiments, personally experience the process of doing mathematics, carry out discovery learning. By verifying guesses and making various attempts, students can summarize the essence of mathematics, deepen their comprehension of mathematical concepts, formulas and theorems, improve their ability to solve problems and broaden their horizons, thus promoting the positive transfer of mathematics learning. Then, teachers can use abundant network resources of computer to strengthen the connection between mathematics and other subjects knowledge, highlight the application value of mathematics, and promote the horizontal transfer of mathematics knowledge. Finally, the application of information technology promote the positive transfer of computer related mathematical skills [25]. Liang points out that mathematics teachers should conform to the development trend of information technology, be good at using information technology to optimize classroom teaching, promote students to change learning methods, and cultivate ability of mathematics transfer of students. The first is to use information technology to change the presentation of teaching content, strengthen students' comprehension and promote transfer. The second is to use multimedia demonstration and means under information technology to develop analogical reasoning transfer. The third is to use information technology to carry out cooperative exploration activities and cultivate ability of inductive transfer of students. The fourth is to use information technology to contact life, solve practical problems and promote the expansion of transfer ability of students [26]. Wu and He point out that the cognitive structure of student is the key to transfer. Teachers can use advantages of multimedia technology to implement analogy strategy, digital and shape combination strategy, dynamic and static combination strategy and separation combination strategy to help student form a good cognitive structure and promote mathematics transfer [27].

### **3.4. Cultivation of Basic Knowledge and Ability**

#### **3.4.1. Pay Attention to the Mastery of Basic Knowledge and Skills**

Zhang believes that any complex knowledge and skill is based on basic knowledge and skills, and only after

mastering basic knowledge and skills the transfer of learning can occur [21]. Sun, Du, and Dang believe that the more solidly and proficiently students master basic knowledge and skills, the easier it will be for them to learn and master new knowledge and skills, and the easier it will be to occur positive transfer [13, 28, 29]. Ma points out that the way to realize transfer is association [22]. Lu, Fu, Jiang, and Wang believe that basic knowledge and basic skills are conditions of association [30-32]. Therefore, Sun and Zhang advocate that teachers should pay attention to teaching basic knowledge and skills [13, 21]. Du, Dang, Lu, and others advocate that teachers should pay attention to the mastery of basic knowledge and skills of students [28-32]. Firstly, teachers should pay attention to the comprehension of knowledge of students, especially some basic concepts, principles, formulas and rules; Secondly, teachers should pay attention to the application of basic knowledge and skills; Thirdly, teachers should pay attention to the training of knowledge availability [28, 30-32]. In addition, Wang points out that the consolidation of basic mathematics knowledge is the foundation of cultivation of transfer ability of students. The first is to strengthen the derivation, comprehension and application of mathematical rules and formulas; The second is to pay attention to the explanation and demonstration of examples; The third is to collect types of wrong questions and urge students to reflect on wrong questions in time and consolidate them [33].

#### **3.4.2. Pay Attention to the Cultivation of Generalization Ability**

Chen points out that the existing mathematical generalization level of primary school student is the key to his transfer of mathematical learning transfer [8]. Zhang also believes that student's level of generalization of existing mathematical knowledge directly restricts the effect of transfer of learning [10]. Sun also points out that the level of analysis and generalization of knowledge of the student is one of the important factors affecting transfer of knowledge [13]. Dang also points out that the higher the generalization level of existing knowledge and experiences of student is, the better he can reveal the essence of some similar things that have not been known, and bring new knowledge into the existing cognitive structure, thus leading to positive transfer [29]. Ma, Lu, Fu, and others also point out that the essence of transfer is generalization [22, 30-32]. Zhou and Cao believe that the abstract generalization ability of student is the core of mathematical ability. The higher the level of mathematical generalization of student, the easier it will be for he to generalize the common factors or substantive the connection between the two kinds of learning, and the better the effect of transfer will be [34]. Lu believes that there is a close relationship between the level of transfer and generalization

ability. The stronger the generalization ability is, the wider the generalization is, and the wider the scope of knowledge transfer is [35]. Therefore, Sun, Zhang, and others advocate that teachers should pay attention to the cultivation and improvement of generalization ability of students [13, 21-22, 29-32, 34-35]. Chen, Zhang, and Du advocate that teachers should pay attention to the improvement of generalization level of students [8, 10, 28]. First, teachers should guide students to summarize what they have learned; Second, they should pay attention to revealing and refining mathematical thinking methods; Third, they should cultivate the habit of reflection of student; Fourth, they should pay attention to the comprehension of mathematical concepts and principles of students and strengthen the guidance of students' general thinking, so that students can master the key points of generalization; Fifth, they should strengthen the application of knowledge; Sixth, teachers should advocate "active" learning methods to achieve meaningful learning and allow students to "actively participate in learning and meaningful construction"; The seventh is to highlight the essence of mathematics by guiding students to accurately summarize the essential characteristics of knowledge, emphasizing the essential characteristics of knowledge, and providing students with abundant examples; The eighth is to teach students methods of analysis, induction and generalization through exercises training [8, 10, 13, 30-32, 34, 35].

### 3.5. Cultivation of Learning Interest

Huang points out that the student's interest in mathematics is closely related to the effect of learning mathematics. Student who is interested in mathematics regard learning as a kind of fun and hobby and is willing to engage in creative learning activities, thus promoting the success of learning [9]. Dang believes that with interest, students can actively explore, think and study, consciously use the known to explore the unknown, realize the positive transfer of knowledge, methods, abilities and other aspects, so that their thinking keep in an active state [29]. Lu points out that under the guidance of strong interest, students query problems bravely and think deeply, which plays a significant role in improving the efficiency of solving problems, thus which is conducive to effectively inducing transfer in the process of mathematics learning [30]. Huang, Lu, and others advocate that teachers should cultivate students' interest in learning, improve their motivation for learning and promote transfer. The first is that teachers' lectures should be vivid and interesting, and they should be good at simplifying complex problems so that students understand them more easily; The second is to explore the elements that stimulate students' interest in mathematics learning, and introduce these elements into mathematics class; The third is that teachers should give students full trust and respect, win love and trust of student

with their own broad mind, and win students' closeness with their personality charm. The fourth is to connect mathematics with the reality of life; The fifth is to change the teaching method and make use of multimedia technology [9, 15, 30, 32, 35].

### 3.6. Learning Set

Liu, Cui, and Rong point out that in the learning of similar subjects, learning set can promote learning and transfer. When solving problems that require multiple considerations, the stronger the learning set is, the more able it will be to interfere and hinder the flexible thinking and creative problem solving. Therefore, teachers should pay attention to the effective use of learning set [3]. Zhang points out that set have both promoting and interfering effects on the transfer of learning of student. Therefore, on the one hand, teachers should adopt appropriate teaching methods to help students understand and master knowledge starting from their familiar knowledge and experiences. On the other hand, they should encourage students to establish a set of searching for knowledge similarity and unity, make full use of the positive set, overcome the negative set, and improve the effect of positive transfer [10]. Xu also points out that under the condition that the situation is unchanged, the set can enable students to quickly solve new problems by mastered methods, which can lead to the positive transfer. When the situation changes, the set will cause the negative transfer. Therefore, in the teaching process, teachers should pay attention to making students' thinking activities not limited to the original set, cultivating divergent thinking ability, and promoting the positive transfer of mathematical knowledge and skills [19]. In order to avoid the negative transfer of thinking set and give full play to positive transfer of thinking set, Zheng proposes three countermeasures: The first is to reveal the essence, so that students can understand mathematics knowledge accurately; The second is to attach importance to the teaching of mathematical thinking methods; The third is to guide students to develop the habit of reflection after solving problems [36].

## 4. Discussion

After the review and summary of the research in the past 20 years, it is found that teaching suggestions and strategies to promote the positive transfer of mathematics learning in previous research mainly focus on six aspects: teaching content, teaching situation, teaching methods and means, basic knowledge and ability, learning interest and learning set.

In terms of teaching content, researchers point out that teachers should reasonably select, organize and apply

teaching content, and strengthen the connection between knowledge contents. On the aspect of teaching situation, researchers point out that teachers should allow students to learn in diversified situations to promote the occurrence of transfer. And it is necessary to create a situation that is similar to the real life, in accordance with the cognitive rules of student and conducive to the application of knowledge to promote the transfer. In terms of teaching methods and means, the researchers point out that the analogy and information technology should be used to promote transfer. As for the cultivation of basic knowledge and ability, the researchers point out that teachers should pay attention to mastery of double base of students, and cultivating generalization ability of students. Teachers should also cultivate student's interest to promote transfer. In addition, learning set has both positive and negative effects on learning transfer. Teachers should use set reasonably, play positive transfer of set, and avoid negative transfer of learning set.

Thus, teaching suggestions and strategies proposed in previous research to promote the positive transfer of mathematics learning have covered a wide range of aspects, which play a great role in promoting the application of transfer of learning theories in teaching, not only improve the teaching effect, but also promote the development of students. However, there are still some deficiencies in the previous research.

First of all, there are deficiencies in the research subject level. Previous research has mainly put forward measures from the perspective of teachers, focusing on how teachers should do to promote transfer of students. There is almost no research from the perspective of students. And students are the main body of learning. The final transfer we need is students' spontaneous positive transfer. Hence, in the future, we can study how to promote the positive transfer of mathematics learning from the perspective of students. The goal of "no need to teach" will be achieved by combining teachers' guidance with students' subjectivity.

Secondly, there are deficiencies in research methods. Most of the previous research are based on the previous transfer theories, applied the speculation and teaching experience practice summary. There are few empirical studies, and the persuasion is not strong enough. In the future, a variety of empirical methods can be used for research. For example, experiments, questionnaires, interviews and other methods could be used for research.

Finally, there are deficiencies in the research content. The previous research is more about how to promote the transfer of knowledge and skills, and there is few research on promoting the transfer of emotion, attitude and habits. In the future, we can study how to promote the positive transfer of

emotion and attitudes of students. What are effects of various teaching strategies proposed in the previous research, which one is more obvious, and whether there is any interaction between the various strategies, most research have not involved. Metacognition of the student also has a significant impact on transfer of learning. Previous studies have not involved how to use student's metacognition to promote transfer of learning. Therefore, we can deeply study how to use metacognition of students to promote positive transfer of mathematics learning of students in the future. In addition, teaching evaluation has the role of guidance and motivation. Appropriate evaluation can have a positive impact on learning of student. Previous studies also have not involved how to use teaching evaluation to promote transfer of learning. In the future, we can study how to promote the positive transfer of mathematics learning from the perspective of teaching evaluation, such as how to promote the positive transfer of mathematics learning based on the subject of evaluation, the content of evaluation and the way of evaluation.

## 5. Conclusion

Through the review and analysis of the research on promoting positive transfer of mathematics learning in the past two decades, the following conclusions are obtained:

- (1) In the past, teaching suggestions and strategies to promote the positive transfer of mathematics learning mainly focused on six aspects: teaching content, teaching situation, teaching methods and means, basic knowledge and ability, learning interest and learning set.
- (2) The teaching suggestions and strategies for promoting the positive transfer of mathematics learning put forward in previous studies have covered a wide range of aspects, and some of them have been researched quite in depth and specific. However, the previous research has the following deficiencies: The research subject is only limited to teachers; The research method is single, and lack of empirical methods; The research content is limited to the transfer of knowledge and skills, and does not involve the transfer of emotion and attitude. There are still blank points on how to promote the positive transfer of mathematics learning based on students' metacognition and teaching evaluation.
- (3) Combined with deficiencies of previous research, it is predicted that future research can make breakthroughs in following aspects: The first is to study how to promote positive transfer of learning from the perspective of students; The second is to study with various empirical methods; The third is to study how to promote positive transfer of emotion and attitude; The fourth is to study deeply how to promote positive transfer of mathematics learning based on

metacognition and teaching evaluation.

The transfer of learning of student will be affected by many factors. In the future, we should improve the research methods, and make a more comprehensive, systematic, specific and in-depth study to promote the positive transfer of mathematics learning.

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## References

- [1] Tang, J. L. (2009). Research and Reflection on mathematics learning Transfer in China. *Journal of Guangxi Normal University (Philosophy and Social Sciences Edition)*, 45 (06): 112-118.
- [2] Xu, Z. T. (2013). Application of learning Transfer theory in Mathematics Teaching. *Editorial Department of Journal of Junior Mathematics*, (01): 1-3.
- [3] Liu, Y., Cui, C. H., & Rong, N. (2007). Effective promotion of learning Transfer in Mathematics Teaching. *Science and Technology Innovation Herald*, (12): 184.
- [4] Chen, Y. P. (2008). On the Transfer of learning in Mathematics Teaching. *Journal of Yanbian Education College*, 22 (06): 67-69.
- [5] Song, L. Y. (2019). Primary Mathematics Textbook Teaching Method Practice Classroom Research—Teaching for Transfer. *Education Modernization*, 6 (22): 119-121.
- [6] Wu, Y. J. (2015). Application strategies of learning Transfer theory in primary school mathematics teaching. *Journal of Seeking knowledge Guide*, (22): 104-105.
- [7] Zhu, H. W., & Zhang, J. Z. (2004). On the Application of Transfer Theory to Mathematics Teaching. *Journal of Mathematics Education*, (04): 17-19.
- [8] Chen, J. (2019). The Application of Learning Transfer in Primary School Mathematics Teaching. *Curriculum in Basic Education*, (24): 48-53.
- [9] Huang, G. Y. (2007). On the Application of Transfer law in Mathematics Teaching. *Heilongjiang Science and Technology Information*, (06): 123.
- [10] Zhang, X. F. (2007). The Application of Learning Transfer Law in Mathematics Teaching. *Agriculture of Henan*, (14): 45 + 51.
- [11] Ning, B. (2014). Research on the Application of Knowledge Transfer in Mathematics Teaching. *Company in Mathematics*, (04): 8-9 + 12.
- [12] Sun, C. L. (2017). An analysis of the Application of learning Transfer theory in high school mathematics teaching. *Education for Chinese After-school (Theory)*, (17): 54 + 56.
- [13] Sun, G. H. (2017). Talking about the Methods of Mathematics Teaching Promoting Learning Transfer. *Course Education Research*, (15): 147-148.
- [14] Li, X. Q. (2017). Application of learning Transfer theory in middle school mathematics teaching. *Theory and Practice of Education*, 37 (02): 60-61.
- [15] Cui, Y. S., & Li, X. R. (2018). Research on Classroom Teaching Strategies to Promote the Transfer of Students' Mathematics Learning. *Foundamental Education Forum*, (31): 7-9.
- [16] Xuan, B. Y. (2018). Application Research of Learning Transfer Theory in High School Mathematics Teaching. *Ability and Wisdom*, (06): 93.
- [17] Tu, R. B. (2006). Mathematics Learning and Mathematics Transfer. *Journal of Mathematics Education*, (04): 1-5.
- [18] Cheng, Y. Q. (2008). Situation Creation and learning Transfer in inverse proportion function teaching. *Maths Teaching In Middle School*, (08): 8-11.
- [19] Xu, H. M. (2008). On the Cultivation of Students' Knowledge Transfer Ability in Mathematics Teaching. *Agriculture of Henan*, (14): 38 + 40.
- [20] Qu, C. H. (2005). Analogy Transfer to optimize mathematical cognitive structure. *Journal of Mathematics (China)*, (12): 14-16.
- [21] Zhang, Z. H. (2005). Focus on student knowledge Transfer Improve math teaching effect. *Journal of Guilin Normal College*, (02): 61-63.
- [22] Ma, B. (2003). Application of Transfer law in middle school mathematics teaching. *Curriculum, Teaching Material and Method*, (12): 29-32.
- [23] Xiong, C. L., Chen, C. L., & Duan, H. G. (2010). Transfer Teaching in Complex Variable Function of Engineering. *College Mathematics*, 26 (02): 203-206.
- [24] Zhang, Z. J. (2019). The Cultivation of knowledge Transfer ability in primary school mathematics teaching -- Taking the Second volume of the Fourth grade of people's education edition as an example. *Course Education Research*, (05): 147-148.
- [25] Sun, M. F., & Wei, X. M. (2006). Applying information technology to promote the positive Transfer of students' Mathematics Learning. *E-Education Research*, (11): 55-56.
- [26] Liang, Q. H. (2018). Discussion on the Cultivation of mathematics Transfer ability of junior high school students with the support of information technology. *Middle school mathematics research (South China Normal University Edition)*, (16): 10-11 + 29.
- [27] Wu, H., & He, X. D. (2013). Research on Teaching Strategies of mathematics Transfer in multimedia environment. *China Educational Technology & Equipment*, (03): 130-133.
- [28] Du, C. D. (2002). Discussion on the Transfer issue in mathematics teaching. *Journal of Continuing Higher Education*, (02): 59-61.
- [29] Dang, X. J. (2013). How to Strengthen Students' Positive Transfer of Mathematics Knowledge in the Background of Efficient Classroom. *Education for Chinese After-school (Theory)*, (08): 94.

- [30] Lu, G. Z. (2014). Research on teaching strategies to improve mathematics Transfer ability. *Journal of Inner Mongolia Normal University (Educational Science)*, 27 (02): 151-153.
- [31] Fu, Y., & Jiang, Q. Y. (2018). Transfer phenomenon in mathematics learning and its significance to teaching. *Middle School Teaching and Research (Mathematics)*, (09): 3-6.
- [32] Wang, W. M. (2018). Teaching strategies to improve the Transfer ability of high school mathematics. *Correspondence of the Teaching of Mathematics*, (09): 62-63.
- [33] Wang, Y. Z. (2016). Discussion on how to cultivate students' knowledge Transfer ability in Mathematics Teaching. *Science and Technology*, 26 (34): 327.
- [34] Zhou, H. L., & Cao, B. (2004). Teaching for Transfer -- on the Application of Transfer law in Mathematics Teaching. *Journal of Xianning Teachers College*, (03): 141-144.
- [35] Lu, J. X. (2018). Study on the Application of learning Transfer theory in high school mathematics teaching. *Fujian Middle School Mathematics*, (10): 14-16.
- [36] Zheng, F. B. (2014). Problem solving defects caused by thinking set. *Shanghai Middle School Mathematics*, (12): 38-40.