ISSN (ONLINE): 2454-9762
ISSN (PRINT): 2454-9762
Available online at www.ijarmate.com

International Journal of Advanced Research in Management, Architecture, Technology and Engineering (IJARMATE)
Vol. 8, Issue 11, November 2022

Research on the cultivation of divergent thinking ability in middle school mathematics teaching

Peisen Li

Major of Mathematics and Applied Mathematics (Student No. 2020075073), College of Mathematics and Statistics, Taishan University, Tai'an, Shandong, China
*Email:1477976227@qq.com

***Abstract*—Divergent thinking can enable students to expand their knowledge and apply it to life, thus solving practical problems, which essentially realizes the significance of mathematics education. Cultivating students' divergent thinking ability can make students' thinking active and flexible, and improve their learning ability and creativity. Therefore, it is very important to cultivate students' divergent thinking ability in middle school mathematics teaching.**

In the middle school stage, mathematics is extremely important. This stage is most conducive to spreading students' thinking and improving their innovation ability. It is teachers' bounden duty to let divergent thinking be better cultivated through mathematics classroom teaching in middle schools, so that students can constantly develop their logical thinking ability and spatial imagination.

As far as the current mathematics teaching in middle schools is concerned, there are mainly the following problems in cultivating students' divergent thinking ability: first, the limitations of teachers in the teaching process; second, the thinking set and psychological influence of students themselves. Therefore, the cultivation of students' divergent thinking ability puts forward higher requirements for teachers. Teachers' ideas should adapt to the ideas of the new curriculum reform; Teachers themselves should also have divergent consciousness and creative consciousness; Teachers should protect students' curiosity; Teachers should study textbooks carefully. Based on the analysis of the limitations and influencing factors of students' divergent thinking ability, this paper proposes ways to train students' divergent thinking ability in teaching, such as conducting classroom discussion, strengthening variant training, and expanding knowledge learned. In teaching, teachers should always pay attention to cultivating students' divergent thinking ability through various ways.

***Index Terms*—Divergent thinking; Logical thinking ability; Spatial imagination; innovation ability; Variant training.**

I. INTRODUCTION

A. Significance of the study

In the process of middle school mathematics teaching, it is very important to train students' ability of divergent thinking. Its influence is not only in the middle school mathematics learning stage, but also has great significance for students' future development. It can enable students to understand the knowledge they have learned and master, and solve the problems that people have not solved from the perspective that others have not considered. It makes thinking more comprehensive and analyzing more original and accurate. Therefore, teachers should pay more attention to the cultivation of students' divergent thinking ability in teaching.

In teaching, to promote students' divergent thinking, teachers need to guide students' thinking through various appropriate methods. However, under the traditional teaching mode, most teachers only care about imparting knowledge, and then ignore the cultivation of students' thinking. Especially under the pressure of the college entrance examination, the students have gradually become a "problem machine", lacking independent thinking, and their thinking has solidified [1-7]. This is not only detrimental to the improvement of students' mathematical literacy, but also makes our new generation of teenagers lack creativity. Therefore, we need to pay attention to the training of students' divergent thinking.

B. Research ideas

Based on my own experience in teaching practice, I really feel that in the current teaching process, teachers lack the ability to cultivate students' divergent thinking, and the negative impact that students get from it. In this context, I have successively collected and read a large number of documents about divergent thinking, and on the basis of personal feelings, I have comprehensively understood the information about divergent thinking. More clearly the results that this article wants to achieve.

This article starts with the concept of divergent thinking, analyzes and summarizes the positive significance of divergent thinking for middle school students' learning. Through the literature reading and my own feelings, this paper comprehensively analyzes the drawbacks of divergent thinking training in the current middle school mathematics teaching process. Classroom teaching is dominated by teachers. Therefore, in view of these shortcomings, higher requirements are put forward for teachers. Teachers should take the lead to improve the cultivation of students' thinking ability. In addition to the requirements for teachers themselves, we also need to make certain improvements in classroom teaching methods, such as classroom discussion, variant training, expansion and extension, to train students'

ISSN (ONLINE): 2454-9762
ISSN (PRINT): 2454-9762
Available online at www.ijarmate.com

divergent thinking.

II. THE SIGNIFICANCE OF CULTIVATING STUDENTS' DIVERGENT THINKING ABILITY IN MIDDLE SCHOOL MATHEMATICS TEACHING

The way of thinking determines the way of behavior. Mathematical thinking is a way of thinking activity to think and solve problems from a mathematical perspective and realize the thinking process of understanding the real world. Convergent thinking and divergent thinking are the forms of thinking that we often use in mathematical thinking. Among them, convergent thinking refers to a directional and orderly thinking process of finding the same solution from many obtained information. At this time, thinking will converge in the same direction. This form of thinking will make students' thinking more organized, logical and rigorous, which is essential for students to understand and master knowledge. For example, when solving a problem, we collect a lot of information, unload different sticky notes, rearrange them in proper order, and use visual aids to think; The students find an answer to the question from various theorem conclusions in the book.

A. Divergent thinking

Divergent thinking is relative to convergent thinking. Divergent thinking, also known as radiative thinking, refers to the process of creating and solving problems, starting from the conditions we have known and mastered, and extending in all directions. In this process, we will not be bound by the known or existing ways and methods, and get a variety of different solutions and different results. At this time, brain thinking will present a radial form of thinking. Generally speaking, divergent thinking is "thinking from one point to all directions". The process of divergent thinking is a developing and open process. It wants to explore unconventional and unique answers. For example, "more solutions to one problem" and "more writing about one thing".

Divergent and convergent thinking are both necessary ways of creative thinking. Among them, the most distinctive feature of creative thinking is divergent thinking, which plays an important role in detecting creativity. The cultivation of divergent thinking can improve students' creativity. Therefore, the cultivation and training of students' divergent thinking ability should be the top priority in middle school mathematics teaching.

B. The significance of cultivating students' divergent thinking ability

When middle school students are learning mathematics, they often need to use the knowledge they have learned to guide new content. In this process, divergent thinking occupies a unique position. Divergent thinking can diffuse the knowledge that students learn, gradually use it in life, and solve life problems, which essentially realizes the significance of mathematics education. Furthermore, students can learn the potential context between mathematics and other courses by using divergent thinking. While learning a course, other subjects can also get certain development, so that students can obtain greater learning effects. The cultivation of divergent thinking can promote the progress of innovative thinking and thinking quality. When students face a mathematical problem, they can analyze it from different angles and get different plans, which can improve their innovation ability and mathematical thinking. Finally, for mathematics learning itself, divergent thinking also has a positive significance. For example, for some mathematical exercises, if we often close our own way of thinking and face some flexible problems, we will often fall into difficulties and can't get rid of them. Through divergent thinking, we can find a new way to think from different angles and get rid of the deadlock, thus improving the learning efficiency. Therefore, divergent thinking is of great significance to middle school students' mathematics learning. We must strive to cultivate this way of thinking in education.

(1) Cultivating students' divergent thinking ability is helpful to improve students' enthusiasm for learning

In our traditional teaching process, teachers usually use the old teaching methods such as indoctrination, spoon feeding and examination oriented to teach mathematics. Most of these teaching methods have defects such as students' passive position, low participation and lack of training for mathematical ability. Under these models, teachers also mostly use the same way to train students' mathematical ability, that is, teachers require students to use the mathematical knowledge and methods they teach to solve the same type of problems, and meet the requirements of mastering this type of problems [2,3]. In this way of learning, although it can quickly consolidate and train students' mastery of basic knowledge, it often only trains students' ability to convergent thinking. The most important thing is that students are not very interested in this teaching mode, which leads to students' lack of inquiry in the process of solving problems, loss of freshness in the results of mathematical problems, which restricts students' thinking and makes it difficult to produce new thinking results. If the teacher trains the students' divergent thinking in teaching by changing one question, solving more than one question, and using more than one picture, he or she should design more divergent questions in the classroom with flexible and diverse thinking methods and unique answers. The teacher guides the students, and the students discuss this, so that students'

ISSN (ONLINE): 2454-9762
ISSN (PRINT): 2454-9762
Available online at www.ijarmate.com

International Journal of Advanced Research in Management, Architecture, Technology and Engineering (IJARMATE)
Vol. 8, Issue 11, November 2022

curiosity and curiosity can be stimulated and displayed. When students are learning to think, if they are full of positive emotions, they can make their thinking more active, so that they can get unexpected gains when thinking about solving problems. By training students' divergent thinking ability, students can flexibly use mathematical knowledge instead of rigid book content, and the methods to solve problems are also changeable with the active thinking, so that students can truly experience the fun of learning and actively learn. This is conducive to developing students' intuitive thinking, cultivating their sense of participation, and thus improving their enthusiasm for mathematics learning.

(2) Cultivating students' divergent thinking ability is helpful to improve students' ability to solve problems

For many years of mathematics learning, what we need to master is not only the theorems, formulas or problem-solving skills in textbooks, but also a rational, organized and systematic way of thinking, which is a kind of ability to solve problems. This ability also plays a very important role in solving many problems in life. However, it is often ignored because of its obscure function. Therefore, the most important thing in mathematics teaching is not to teach them how to solve problems quickly and effectively, but how to arouse students' curiosity, so that they can learn to find and look at problems from different angles by using students' psychology. Divergent thinking is one of the important thinking in exploring and solving mathematical problems. The solution to many problems is to use divergent thinking, explore a variety of possibilities and continue to experiment, so as to get the best solution. In essence, this kind of thinking is the combination and blending of divergence and convergence. The cultivation of divergent thinking is a thorny and urgent problem for teachers. He needs teachers to be tolerant of students, and teachers need to constantly guide and encourage students. Only in this way can students think more, express their opinions bravely, and have the courage to question what they feel is wrong, even if it is an authoritative expert. Students' autonomy is the key for them to open their eyes to see a wider, more novel and better world. Students' thinking ability to discover, propose, explore and solve problems will also be rapidly improved under such autonomy.

(3) Cultivating students' divergent thinking ability is helpful to improve students' creative ability

The core of creative thinking is divergent thinking. Therefore, when divergent thinking is cultivated and improved, students' creative thinking will also increase accordingly. Divergent thinking and innovative thinking have very similar main characteristics, so we say that divergent thinking can reflect innovative thinking to a certain extent. From these we can get that the training of students' divergent thinking ability is helpful to improve students' creative ability. Therefore, teachers should encourage students' thinking in teaching. Students can actively explore problems from different angles and directions, which can greatly improve students' creativity. In short, divergent thinking is a multi-directional and open way of thinking, which is opposite to a single, rigid and closed way of thinking [4]. Divergent thinking is like the umbrella bone, which takes the umbrella handle as the center and radiates in all directions. This form of thinking can make students have a broader vision, more sensitive and active thinking, and more innovative consciousness.

III. THE PROBLEMS AND INFLUENCING FACTORS IN CULTIVATING STUDENTS' DIVERGENT THINKING IN CURRENT MATHEMATICS TEACHING

In the current process of mathematics teaching in middle schools, the cultivation of divergent thinking is stagnant. The reason lies in the lack of students' interest in mathematics learning, which leads to students' unwillingness to think actively, let alone divergent thinking. The emergence of this problem is mainly affected by two factors: teachers and students themselves.

A. Influential factors from teachers in the cultivation of students' divergent thinking

The backward concept is the real backward. The stale teaching concept of teachers will inevitably lead to the unchanging classroom teaching, which will limit the cultivation of students' divergent thinking. Such teaching modes as indoctrination, spoon feeding, examination oriented and question sea make students rely entirely on the guidance of teachers and lack independent thinking, which is not conducive to tapping students' divergent consciousness. At the same time, we can not ignore the influence of teachers' personal accomplishment on the cultivation of students' divergent thinking ability.

(1) Teachers' teaching concept

The teaching concept is the teacher's personal cognition of the whole teaching process, and is the view and basic attitude and concept of teaching activities. Under the implementation of the new curriculum reform, although the teachers have systematically learned the content of the new curriculum reform and understood the spiritual connotation of the new curriculum reform. However, most teachers still cannot abandon the traditional teaching methods, making these old teaching methods still rooted in classroom teaching. If students have been learning under this conservative and lack of innovation teaching concept, their behavior and thinking will also be limited. In the long run, the innovation and divergence that we

ISSN (ONLINE): 2454-9762
ISSN (PRINT): 2454-9762
Available online at www.ijarmate.com

International Journal of Advanced Research in Management, Architecture, Technology and Engineering (IJARMATE)
Vol. 8, Issue 11, November 2022

want to cultivate in education will be difficult to be revealed. Under such a teaching background, students are bound to be stuck in a closed and narrow way of thinking. Students' enthusiasm and creativity are also difficult to grow.

(2) Teacher's teaching mode

Teaching mode is the teaching form used by teachers in the process of classroom teaching. In our country, the most common teaching models in middle school mathematics classroom are nothing more than indoctrination, spoon feeding, sea of questions, examination oriented, etc. In these teaching models, there are certain drawbacks. The teacher spoke on the platform and the students listened below, ignoring the enthusiasm of the students, which made the students lack of thinking in the process of mathematics learning. Or the teacher only explains the content of the exam, and only talks about the content of the exam. All the knowledge that is not in the exam outline will not be taught. This will ignore the students' curiosity about mathematical knowledge, making them lack interest and confidence in future learning. Or in order to let students master and consolidate knowledge, teachers blindly assign students a large number of exercises to practice, so that students become "problem machine", so that students become numb and lack passion when facing mathematics learning. These old teaching models are not conducive to stimulating students' interest in mathematics learning, making students lack independent thinking, and are not conducive to the cultivation of divergent thinking.

In the process of mathematics classroom teaching, the teachers' arrangement for the new teaching is almost indiscriminately divided into five steps, namely, reviewing the content learned in the previous lesson, introducing the knowledge to be taught in this lesson, practicing and consolidating the knowledge taught in this lesson, summarizing the knowledge of this lesson, and finally assigning homework. The content of homework in this form is similar, which can not be separated from review and preview. Review and consolidate the knowledge learned today, and also preview the content taught in the next lesson. Each step taken by the students in this stereotyped process is not from their own heart, but under the guidance of teachers, which makes the students have no interest in mathematics, let alone cultivating students' mathematical literacy and training their divergent thinking ability. [8] discussed about specific Policy document which ensures of which the teaching, learning in addition to assessment methods are upwards to the amount of typically the course and are ideal to the attainment involving objectives and intended understanding outcomes of the program and the course. The particular policy requires that school members use recent in addition to variety of teaching, mastering methods and assessment methods.

(3) Teachers' personal accomplishment

Personality charm, knowledge and cultivation, and vision pattern are all the contents of personal accomplishment. When we sincerely admire and respect someone, we will also love things related to him. Therefore, teachers' personal accomplishment will also affect students' interest in learning the subject to a certain extent. The core of education is to cultivate people with high moral character. If teachers themselves have noble moral character, they will influence students imperceptibly in the process of getting along with students, making moral education achieve twice the result with half the effort. When students are positively affected by teachers, they will have a strong interest in mathematics learning and are willing to take the initiative to think. They will spread their thinking from different angles.

B. Factors influencing students' divergent thinking

In addition to the influence factors of teachers, students' own factors also affect the cultivation of students' divergent thinking ability. In the whole process of mathematics learning and problem solving, there will always be some habits of thinking set, which can easily make students develop a mechanical and rigid thinking habit and hinder the cultivation of students' divergent thinking. Moreover, there is the students' "giving up mentality", which makes them always in the "comfort zone" of thinking, and it is difficult to get a breakthrough in thinking.

(1) The influence of students' own thinking set on divergent thinking ability

Thinking set is a common and unavoidable normal phenomenon in the process of students' mathematics learning. It is also like a double-edged sword. Sometimes students rely on the knowledge and experience they have learned before, which will be of great help to solve some mathematical problems, because the thinking set also reflects students' familiarity with certain knowledge or methods to a certain extent, which can help us "take shortcuts" and reduce certain losses; But sometimes it will also restrict students' thinking, making it difficult for them to think out of the original thinking. If they rely too much on the experience of previous thinking, students' thinking will slowly degenerate and stop moving forward. While causing irreversible damage to students' imagination and creativity, they cannot make students think from other aspects of the problem. At this time, thinking set will become an obstacle for us to solve problems. For example, when we ask students to draw a coordinate axis, students

ISSN (ONLINE): 2454-9762
ISSN (PRINT): 2454-9762
Available online at www.ijarmate.com

International Journal of Advanced Research in Management, Architecture, Technology and Engineering (IJARMATE)
Vol. 8, Issue 11, November 2022

always habitually mark the right as the positive direction of the x axis and the up as the positive direction of the y axis; For another example, when making auxiliary lines, we always think of parallel bisector first; And when asked to draw a straight line, most students draw from left to right, from top to bottom, and so on, which are common thinking stereotypes of students in mathematics learning. Although there are no mistakes in these habits themselves, it is precisely because of these "fixed impressions" that students' thinking is largely limited [5].

(2) The influence of students' psychological quality on divergent thinking ability

Moreover, the psychological quality of students also affects their divergent thinking. For example, our common "psychology of giving up difficulties", when students face the last big mathematical problem, they will subconsciously think it is a "difficult problem". Some students even give up thinking without reading the problem, let alone solving it from different angles. This seems to be the laziness of the students themselves. In fact, in the long run, when the students face problems, they will have a fear, retreat from difficulties, and it is difficult to develop and cultivate their thinking.

IV. Requirements for Teachers in the Training of Middle School Students' Divergent Thinking Ability

Cultivating students' ability of divergent thinking is a lasting and huge project, which puts forward higher requirements for teachers. Teachers' teaching concept should keep pace with the times, adapt to the development of society, and transform from a single knowledge imparting to a guide for students' learning and a promoter for students' development. Teachers themselves should have a strong sense of innovation and divergence. Teachers' exploration of innovation awareness in teaching design, teaching research and discipline research affects the cultivation of students' divergent thinking. In teaching, teachers should timely capture students' "unconventional" problem-solving ideas, and encourage and guide them.

A. Teachers' ideas should adapt to the ideas of the new curriculum reform

The times are changing, and teachers' ideas should also adapt to the development of the times. Modern teachers should change their ideas. Teachers should not only impart students' knowledge, but also take promoting students' development and guiding students' learning as the top priority. Teachers' recognition of tasks is not only the classroom teaching, but also the research on the teaching process. Teachers' main position is not only classroom, but also pay attention to the research of teaching ideas to provide theoretical support for teaching. At the same time, we should pay attention to summing up and accumulating practical experience to achieve continuous progress in teaching ability and innovation in curriculum implementation.

In short, teachers' responsibilities are no longer single, but comprehensive; It is not static, but developing.

B.Teachers should have a strong sense of innovation and divergence

Whether teachers themselves have divergent consciousness and creative consciousness is an important factor in cultivating students' divergent thinking ability. If teachers are stuck in their own way and lack of divergent and innovative consciousness, they will inevitably form constraints on students. Therefore, while implementing quality education, we must pay attention to the improvement of teachers' quality. Among them, teachers' exploration of creative consciousness is the most important standard. The creative consciousness of middle school mathematics teachers is mainly manifested in: innovation of teaching design; Innovation of teaching research; Innovation in discipline research.

C.Teachers should protect students' curiosity and stimulate their curiosity

The curiosity about things, the desire for knowledge and self-confidence are closely related to the development of creativity, and there is a restrictive relationship between them. Similarly, the cultivation and development of divergent thinking is inseparable from the protection of students' curiosity and the stimulation of their curiosity [6]. When students try to divergent thinking, think and explore problems from different angles to find solutions to problems, even if students have more or less problems in their thinking, teachers should still encourage and cheer them on, not attack and ridicule students, so that students' self-confidence will be hurt. Teachers should have enough patience, guide students in thinking, and help students find the right way of thinking and problem-solving ideas. In a word, we should protect and encourage students' curiosity and thirst for knowledge. Only when students' curiosity and thirst for knowledge are encouraged and praised, students' exploration spirit and action force for things will develop in a positive direction. On the contrary, if students' curiosity and thirst for knowledge are hit, the flexibility of students' thinking will be suppressed, so that students gradually lose confidence, and ultimately the cultivation of divergent thinking ability will become an empty talk.

D.Teachers should carefully study the textbooks and explore the "divergent" factors

The change and innovation of teaching mode is based on teachers' unique interpretation and understanding of textbooks. Therefore, teachers are required to carefully study the textbooks. For example, teachers should conduct in-depth research on the examples in the textbooks to discover the diverging points in the examples. They can use this as the material to design teaching links. They can use the methods of "multiple solutions to one problem", "multiple changes to one problem", etc. to add classroom discussion links in classroom teaching. During the discussion process, teachers should encourage students to express their views freely and listen to other people's different ideas, Work together to get the right

ISSN (ONLINE): 2454-9762
ISSN (PRINT): 2454-9762
Available online at www.ijarmate.com

answer. Of course, classroom discussion does not blindly let students express their views in an orderly manner. In this process, teachers should still play a leading role. Only under the vivid and refined explanation and guidance of teachers can students' classroom discussions inject their soul, be orderly and intense, and have profound contents [7]. [9] discussed about specific Policy document which guarantees security and honesty of understudies' records documented and kept in the Registration Office. The records ought to be overseen in a precise and sensible way as indicated by plans created by the Registration Office that keep up these records. The strategy report and methodology spread the accommodation of records and grades to the Registration Office, documenting, putting away and protection arrangement of the understudy records, locking of the class records and the discharging of transcript and testaments.

In middle school mathematics teaching, it is very important to cultivate students' divergent thinking ability. Therefore, higher and newer requirements are put forward for teachers. As lifelong learners, teachers should renew their teaching concepts and try new teaching models to meet the needs of the development of the times. From the traditional mode to the new classroom teaching mode. Strive to create a positive teaching environment, so that students can reduce the pressure, reduce the psychological burden, and study healthily and happily in this learning environment, which can better cultivate students' mathematical literacy and thinking. So that teachers can achieve the desired effect of divergent thinking training.

V. THE EFFECTIVE WAY TO CULTIVATE STUDENTS' DIVERGENT THINKING ABILITY IN MIDDLE SCHOOL MATHEMATICS TEACHING

In order to cultivate students' divergent thinking ability, the higher requirements for teachers are put forward, and to pursue its origin, which is to change teachers' ideas and thinking, adapt to social development, make the classroom "alive", stimulate students' interest in learning, be good at thinking, be brave in expressing ideas, and then achieve the purpose of cultivating divergent thinking. Get rid of the shackles of the old teaching framework before, and make the main body of the classroom become the students. In classroom teaching, teachers can also train students' divergent thinking ability through classroom discussion, variant training, knowledge expansion and other teaching methods.

A. Conduct classroom discussion

The compilation of mathematics textbooks is often carried out according to a strict logical system. We do not deny that such writing form can cultivate students' logical thinking ability to a certain extent. But at the same time, it will also restrict students' divergent thinking. Therefore, it is necessary for teachers to have a comprehensive and in-depth study of the textbooks and carry out classroom discussions on some of the knowledge points. Teachers guide students to express their opinions boldly and conduct fierce discussion by designing problems that can trigger thinking. In the process of discussion, different students will certainly think about the same question from different angles and produce different answers. Teachers should summarize students' effective methods, so that students can understand many schemes, and finally get the optimal solution we want through analysis and comparison. In this way, under the effect of classroom discussion, students' enthusiasm for learning has been improved, and divergent thinking and convergent thinking have also been exercised [5].

B. Strengthen variant training

To develop students' divergent thinking ability depends not only on teachers' teaching methods, but also on purposeful and planned training. In training, we should also pay attention to the amount of training. We should not blindly use the sea of questions tactics. We should make the training appropriate and appropriate, so that the training can achieve the desired effect. In the process of mathematics teaching in middle schools, we can train students' thinking by means of "one problem is changeable" and "one problem has multiple solutions". The teacher carefully designs some classic examples containing open elements in combination with the knowledge content to be taught in this section and the students' own conditions. Teachers enlighten and enlighten these examples to stimulate students to think actively, which can make students' divergent thinking get a good exercise. At the same time, in such training, teachers should pay special attention to the different ideas that students have when thinking about solutions. We should give students a positive evaluation of their divergent thinking. This can greatly improve the enthusiasm of students' thinking and exercise their innovative spirit. Once the teacher opens the valve for students to think positively, they will gradually find the right direction of thinking, and the students' thinking system can be gradually constructed. In this way, teachers will not need to give too much inspiration in the future, but only need to make suggestions on key issues, so that students' thinking can be guided to think more deeply, and their thinking will be better developed [6].

C. Proper development and extension

In classroom teaching, teachers can appropriately extend the knowledge theories that students have already mastered, and gradually guide them to conduct new exploration and learning on the original knowledge structure. Such training can not only help students consolidate the knowledge framework they have learned, but also enable students to think deeply about problems in mathematical thinking activities. It is a rare and valuable thinking quality to train students to grasp the root of the problem through simple and simple phenomena and draw

ISSN (ONLINE): 2454-9762
ISSN (PRINT): 2454-9762
Available online at www.ijarmate.com

International Journal of Advanced Research in Management, Architecture, Technology and Engineering (IJARMATE)
Vol. 8, Issue 11, November 2022

inferences from one instance according to the nature of the problem, which is extremely important for the cultivation of divergent thinking ability. In teaching, teachers can change the conditions or conclusions from some commonly used knowledge, so that students can give new answers to propositions in a new context. This allows students to explore and discover new propositions based on previous principles and methods. It not only helps students to establish a complete knowledge structure system, but also cultivates their flexibility and profundity of divergent thinking [7].

To sum up, in middle school teaching, teachers can train students' divergent thinking ability in a variety of ways. But at the same time, we should pay attention to that when students are engaged in creative activities, they need not only divergent thinking ability, but also divergent thinking and convergent thinking, which are mutually restrictive and complementary. For example, in the face of complex problems, creative people will not easily make judgments without thinking. They will conduct a comprehensive analysis of the problem, synthesize various schemes according to their environment, and select the most appropriate one. In the whole process, not only is divergent thinking reflected, but convergent thinking also plays a crucial role. The first half mainly uses divergent thinking, while the second half is convergent thinking. If the divergent thinking in the first half of the paragraph is missing, the analysis of the problem may be missed. Incomplete and insufficient consideration will affect the role of the later convergent thinking, making it impossible to proceed, or missing the solution to the problem, leading to the failure to get the best result. If there is no convergent thinking in the second half, even though the divergent thinking ability in the front is excellent and there are countless solutions to the problem, the optimal solution cannot be selected smoothly and correctly in the end. It can be seen that divergent thinking and convergent thinking are complementary and indispensable. The cultivation of thinking cannot be too single and one-sided. In practice, if we only pay attention to the training of students' divergent thinking ability, there will be bias. No matter which way of thinking is neglected, it is a wrong way of training. Therefore, in the teaching process, teachers should train students' divergent thinking and convergent thinking on the basis of combining their own characteristics of the mathematics curriculum, so that students' mathematical thinking can be exercised and improved in all aspects and better adapt to the development of the new era.

VI. CONCLUSION

This paper starts with the concept of divergent thinking, analyzes the positive significance of cultivating students' divergent thinking ability, and clarifies the pivotal position of divergent thinking in middle school mathematics learning. It is clearly pointed out that we should strive to cultivate students' divergent thinking in teaching, so that students can get better development. Secondly, in view of the common teaching methods in the current mathematics teaching, this paper points out that there are certain drawbacks in these methods for the cultivation of students, and summarizes the factors that affect the cultivation of students' divergent thinking ability. In view of the influencing factors and problems in the training process, this paper mainly makes analysis and suggestions from the following two aspects: first, put forward new requirements for teachers, and second, carry out effective training and training in the teaching process. The new curriculum reform points out that classroom teaching should be student centered and teacher led. Teachers' correct and active guidance can stimulate students' interest in learning and truly become the main body of the classroom. Therefore, the role of teachers here is crucial.

REFERENCES

[1] C,Y, Ma.,How to cultivate students' divergent thinking in middle school mathematics teaching. Mathematics Learning and Research (Teaching and Research Edition), 2013 (3): 31-31.

[2] Y.W. Wang, Research on cultivating students' divergent thinking in high school mathematics teaching, Master's Thesis of Inner Mongolia Normal University, 2016

[3] F.Tan, On the cultivation of divergent thinking ability in mathematics teaching Mathematics Learning and Research: Teaching and Research Press, 2015, 000 (003): P.30-31

[4] Z.H. Yao, Talk about how to cultivate students' divergent thinking ability, The Way to Success, 2011, 000 (008): 80-81

[5] S.E. Wang, On the cultivation of students' divergent thinking ability in mathematics teaching, Education and Teaching Forum, 2010 (02): 41-41

[6] B.M. Fu, On the Cultivation of Divergent Thinking Ability in Middle School Mathematics Teaching, College Entrance Examination, 2013 (2): 85-85

[7] C.L. Lu, Training students' divergent thinking in mathematics teaching, Middle School Teaching Reference, 2013, 000 (010): 75

[8] Christo Ananth, "Policy Document on Teaching, Learning and Assessment in Higher Quality Accredited Institutions", International Journal of Advanced Research Trends in Engineering and Technology (IJARTET),Volume 5,Issue 2,February 2018,pp:27-31

[9] Christo Ananth, "Policy Document on Academic Support System of Students, Securing Student's Records and New Student Induction at Higher Quality Accredited Institutions", International Journal of Advanced Research in Management, Architecture, Technology and Engineering (IJARMATE),Volume 4,Issue 3,March 2018,pp:207-212