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A Survey and Study on the Current Status of Mathematics Study Habits of Rural Junior High School Students in China

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Abstract
Based on the relevant theories, the article adopts literature research, questionnaire survey, and interview records to first analyze and summarize the research related to " mathematics study habits" and to define and classify the concepts related to "mathematics study habits." Take rural junior high school students in a school in China as the target group, and analyze the current situation of mathematics study habits of rural junior high school students in this school through a questionnaire survey based on the results. Furthermore, through personal interviews with rural junior high school students, teachers, and parents in the region, we completed the analysis of the factors that contribute to the formation of good mathematics study habits in rural junior high school students from the perspectives of students, teachers, and parents. Finally, combined with the current situation and influencing factors of mathematics learning habits of rural junior high school students in the region, corresponding countermeasures are proposed for the cultivation of good mathematical learning habits from the three perspectives of students, teachers and parents.
Keywords: Rural junior high school students, Mathematics study habits, Influence factors, Habit development measures
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1. Introduction

1.1 Research background and significance

1.1.1 Research background

During the teaching internship in a junior high school in Jiangsu China, the author found that the teaching style of rural junior high school teachers is generally single. They only pay attention to students' test scores and cannot well guide students to develop good mathematics study habits. In addition, most rural junior high school students do not realize the importance of mathematics study habits and ignore the problems of their own mathematics study habits. Due to the lack of good mathematical habits, students are unable to complete the transition from "learning" to "knowing." With the increasing amount of knowledge, students feel more and more struggled to learn, and their performance in mathematics is becoming worse and worse. As a result, the students have fear and rejection of mathematics, and their performance in mathematics continues to decline. The purpose of this paper is to investigate and analyze the current situation of mathematics study habits of rural junior high school students. Through personal interviews with students, teachers, and parents, we analyzed the factors affecting mathematical habits. We developed countermeasures for "cultivating good mathematical habits in rural junior high school students."

1.1.2. Research significance

The subjects they study in junior high school change from fewer to more for students. Students are transitioning from adolescence to youth during this period, experiencing the process from childishness to rationality, from dependence on parents to the desire to be independent, so this is a critical period for students to explore mathematics learning methods and develop good mathematics study habits. Most of the students' performance in elementary school is not bad. Still, they gradually fail to catch up with the normal teaching progress in junior high school and gradually fall behind, which has a great relationship with their failure to develop good mathematics study habits.

For parents, most parents of rural junior high school students go out to work and are away from home all year round. They lack attention to their children and advanced educational concepts. Their children are unsupervised and tend to develop many bad habits, such as not studying before class and not completing homework on time after class. At the same time, with the popularity of computers and cell phones, students are extremely easy to be addicted to them. They begin to become unfocused on their studies. They do not form good mathematics study habits, which is the reason why we urgently need to study the mathematical habits of rural junior high school students.

For teachers, give a man a fish, and you'll feed him for a day. Give him a religion, and he'll starve to death

while praying for a fish means that it is more important to cultivate students' learning habits in addition to the daily teaching of textbook knowledge and the instruction of learning methods. It can be said that the cultivation of students' good mathematics study habits is the most important teaching task for mathematics teachers.

On the one hand, this paper provides an important and realistic basis for studying mathematical habits in rural middle schools. On the other hand, the relevant research in this paper also provides new ideas for the relevant teaching work of mathematics teachers in rural areas.

1.2 Research content and methodology

1.2.1. Research content

By means of questionnaires, this paper investigates the situation of mathematics study habits of rural junior high school students in a school in China to understand the basic situation of mathematics study habits of rural junior high school students in the region. Then, through personal interviews with rural junior high school students, teachers, and parents in the area, we tried to analyze the factors affecting the good mathematics study habits of rural junior high school students by combining the basic mathematics study habits of rural junior high school students we had previously learned. Finally, this paper gives some suggestions for improving mathematics study habits of rural junior high school students through the research theories of experts in related fields and combined with my own teaching situation in the process of internship, hoping to provide some help for rural junior high school students to improve their mathematics study habits.

1.2.2. Research methods

In this paper, research methods such as literature, questionnaire survey, and empirical methods were used based on the existing conditions and research tools.

1.3 Research design

1.3.1 Research ideas

In this paper, on the basis of reading-related mathematics study habits literature, we developed a mathematics study habits questionnaire for junior high school students in a certain region of China. In the course of the survey, a sample of Grade 7 students from a rural middle school in China was selected for the study, and student data were summarized for analysis to gain a preliminary understanding of the current status of mathematics study habits in rural middle school students in the region. Then, we analyze the factors affecting the mathematics study habits of rural junior high school students through interview surveys so as to provide theoretical support for the teaching of mathematics in junior high school. Finally, on this basis, this paper proposes cultivation strategies for the mathematics study habits of rural junior high school students.

1.3.2. Research subjects

The subjects of this research study are two classes of students in Grade 7 of a school in a rural area of China. Each class has about 50 students, and the total number of students in the two classes is 102. A total of 102 questionnaires were distributed, and 99 were returned, with a return rate of 97.06%, and 99 valid questionnaires with an efficiency rate of 100%.

1.3.3.Preparation of questionnaires

Before designing this questionnaire, we reviewed a large amount of literature and conducted an in-depth and detailed study on the mathematical study habits of rural junior high school students. Based on this, 27 questions were carefully designed, and the contents of the questionnaire are as follows:

Table1

The title number	Content
Including questions 1-4, a total of 4 questions	mainly to investigate some basic information of rural junior high school students in the region.
Including questions 5-7, a total of 3 questions	mainly investigating the current situation of pre-school mathematics study habits of rural junior high school students in the region
Including questions 8-11, a total of 4 questions	mainly investigating the current situation of classroom mathematics study habits of rural junior high school students in the region
Questions 12-16 (5 questions in total)	which mainly investigated the after-school mathematics study habits of rural junior high school students in the region
Including questions 17-24, with 8 questions in total	mainly investigating students' motivation, self-motivation, interest, and confidence in learning mathematics in the region
Including questions 25-27, a total of 3 questions	mainly investigating the concern of parents of rural junior high school students in the area for their children's learning

2 Literature review

2.1 Definition of related concepts

Mathematics study habits

The Encyclopedia Britannica defines habits as habits, in psychology, any frequently repeated act that requires little or no thought, is acquired, not innate. Mathematical learning habits are higher mental processes in mathematical disciplines that students maintain in order to be more demanding or perceived, and form rigid behaviors. If students develop good learning habits in the process of studying, they can let students turn learning into a need, so that they can save time and effort, and do it according to their own automation habits, so it is easy to obtain more mathematical knowledge.

Some scholars believe that study habits are the automatic behaviors that students develop about learning and that study habits have the following characteristics:

1. Acquired nature. That is, study habits are not born but gradually formed under continuous practice later in life.
2. Stability. Because learning habits are the simple repetition of a certain way of behavior in a certain context, they have the characteristic of stability.
3. Automation. In terms of psychological mechanisms, learning habits are a conditioned reflex system of automation and stereotypes about learning behavior that is eventually established through long-term reinforcement and accumulation.[1]

To sum up, study habits are an automatic and fixed conditioned reflex behavior about learning formed over a long period of time. Good study habits can improve learning efficiency and can promote students' independent and autonomous learning, while bad study habits can reduce learning efficiency, and students cannot learn independently. [2] In order to facilitate the in-depth study of mathematical learning habits, a detailed analysis is carried out, and from the perspective of time periods, and according to the actual situation of conventional teaching, it is divided into three categories, which are pre-class, in-class and after-class mathematical habits.

(1). Pre-course study habits:

Pre-lesson study habits prepare students for the class before class. A good pre-class learning habit is externally manifested in the relevant learning plan of the content learned in the classroom, the material preparation (stationery, books, etc.) related to the classroom, and the full mental state. In addition, due to the distinctive characteristics of mathematics disciplines, efficient pre-class learning habits in mathematics are not simply browsing the knowledge of the textbook, but more importantly, in the process of students studying the textbook before class, while sketching out the key content and marking the knowledge of doubt, it is convenient to listen to the lecture in the classroom and make corresponding connections to consolidate.

(2). Lesson study habits

Classroom learning habits refer to the highly frequent behaviors that are exhibited in the classroom during the course of the classroom. A good classroom learning habit is externally manifested as listening carefully to the class, responding positively to the teacher, not sleeping and not wandering, and actively taking class notes. As the main source of knowledge for most students, the classroom is directly related to the quality of learning outcomes.

(3). After-school study habits

After-school learning habits are generally to consolidate, understand and apply classroom knowledge, and the learning behaviors expressed after class. A good after-school learning habit is complementary to the pre-class and classroom learning habits, and its external performance is not only to review and reflect on the knowledge learned, to complete the homework independently, but also to do questions and exams. Among them, whether it can be done in the process of doing questions and examinations, whether it can be carefully reviewed, inspected, and studied into difficult problems. In addition, after-class learning habits include asking questions if you don't understand, correcting errors in time and quiet study during self-study periods. After class is the main time for students to enrich and improve themselves, and excellent learning behavior is the key factor in achieving the success of "overtaking in curves". In addition, compared with classroom learning habits, after-school learning habits accompany students for a longer time and have a greater impact on students.

2.2 Research status

Foreign research on the teaching and training of learning strategies started earlier, the field of Western educational psychology has risen from the early 1980s, and the content involved in research is more comprehensive, the value of research results is more prominent, in this paper, learning from foreign education research experience is of great help. The great ancient Greek philosopher Socrates (1991) has already attached great importance to the method of education, and he used the means of "spiritual midwifery" in the process of cultivating students' learning habits, through metaphors and guidance to inspire students' learning interest and questioning behavior habits [3]. The famous American educator John Dewey (1996) first defined metacognitive consciousness, and elaborated on the composition, influencing factors and application of metacognition, expanding the thinking of research habits [4]. Avarsus Khomlinsky (2016), a well-known Soviet educationalist,

analyzed the shortcomings of the family's educational environment as the root cause of children's poor learning habits, and he also believed that the social and school environment played an important role in the cultivation of students' learning habits[5].According to the Swiss educator Pestalozzi (2008), the most important educational content among the various educational contents is the cultivation of moral character. Only on the basis of the development of sound morality, children can show interest in many contents of the external world. The most important tool in the process of developing study habits is the study of mathematics. The development of mathematics study habits can lead to the development of study habits in other subjects, which is determined by the characteristics of the mathematics subject itself[6]. Handayani (2021) et al. argued that one of the low mathematical problem solving skills and flexible thinking habits of students comes from a state of learning that has not yet reached its optimal state. Therefore, a learning that improves students' mathematical problem solving skills and develops flexible habits of mind is needed. The mathematical problem solving skills and flexible habits of mind of students who learn using the Inquiry Collaborative Model (ICM) and direct learning were described and examined. A mathematical relationship between mathematical problem solving skills and students' flexible habits of mind was found to exist[7].

To summarize the relevant aspects of research in China, two main directions were chosen for this paper: the variability of students' study habits at different grade levels and the influence of students' families to observe the variability of students' study habits.

Zhu Xiumei et al. (2009) conducted a survey on the basic situation of mathematical learning habits and methods by distributing questionnaires to high school students, and concluded that most of the high school students had a poor sense of summary and reflection. In addition to the comparison of different types of objects, it was found that in the class, the key class and the ordinary class had less difference in learning purposes, and there were large differences in habits and methods such as pre-study, taking notes, summarizing and reflecting; in terms of gender, there were obvious differences in the mathematical habits of boys and girls, and there was no difference in mathematical learning purposes, notes-taking, summary, and reflection [8]. Chen Fu (2011) investigated and studied the mathematical learning habits and methods of 706 students in the first and third grades of the three junior high schools in Zhaoping County by means of questionnaires and case interviews, and came to the following conclusions: most of the junior high school students in the mountainous areas did not develop good mathematical learning habits; the mathematical learning habits of junior high schools in different grades in the mountainous areas were quite different [9].Feng Haiying (2007) surveyed 323 middle school students through the Secondary School Learning Strategy Questionnaire and the Parenting Style Questionnaire of Students, and concluded that there were no gender differences in the learning strategies of middle school students, and there were significant stage differences in cognitive strategies; there were obvious differences in parental parenting styles, and parents interfered with boys more than girls; in addition, different attitudes of parents led to different learning strategies; and finally, the influence of fathers' parenting styles was greater than that of mothers[10]. Chen Lijin (2020) used the questionnaire method to survey 645 high school first- and second-year high school students, learned about the basic information and mathematical learning habits of students, and believed that the mathematical learning habits of high school students were generally better, and the mathematical learning habits of review and pre-study were poor; the learning habits of high school students of different grades and genders were quite different; and finally found that mathematical learning habits were highly correlated with academic performance [11].

Li Xiaoli (2008) conducted a questionnaire survey of 1317 primary school students and found that the overall level of learning habits of primary school students was better, and there were significant differences in learning habits in terms of gender, grade, whether they were only children, family location, parents' education level, parents' attitudes towards students' learning, family atmosphere, family structure and academic performance. Specifically, the learning habits of girls are superior to those of boys, the learning habits of primary school students continue to increase with the grade level, and the influence of school and family education affects the formation of learning habits of primary school students, which are necessary conditions for achieving good results [12]. Xu Zhenheng (2014) studied the learning habits of junior high school students through practical research, summarized and analyzed several important factors affecting the formation of students' mathematical habits, and concluded that school factors had the greatest impact on students' learning habits of mathematics, while teachers had the most specific impact on students' mathematical learning habits. In addition, it is believed that the personal quality of students is also an important factor affecting mathematical learning habits. Finally, it is proposed that teachers should combine their own teaching methods with students' personal qualities in cultivating students' mathematical learning habits [13].

3 Questionnaire content and analysis of results

3.1 Questionnaire content

See Annex I

3.2 Analysis of survey results

3.2.1. Analysis of the results of the survey on basic information of rural junior high school students

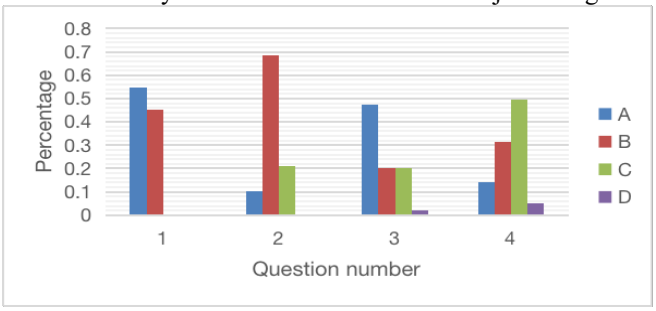

Figure 1. Basic information analysis of rural junior high school students

In the questionnaire, the first question is to investigate the gender in the basic information of students, and it can be seen that the gender of the respondents of this questionnaire is selected reasonably. Question 2 is a survey of the mathematics performance of the respondents, and it is found that the students in this survey are generally in the middle to lower level of performance, with fewer students excelling. Question 3 is about students' perceptions of the influence of mathematics study habits on mathematics performance. Students generally believe that good study habits can lead to good academic performance. The final question 4 was about students' own mathematical habits. The majority of students believed that their own mathematical habits were poor, which was more in line with the results of the survey on mathematical performance.

3.2.2 Analysis of rural junior high school students pre-course mathematics study habits survey results

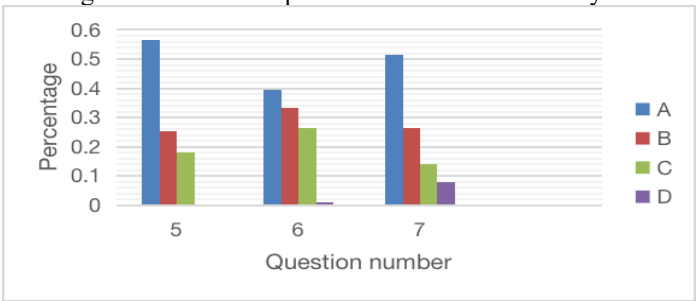

Figure 2. Analysis of the results of the survey results of pre-class mathematics learning habits of rural junior high school students

Questions 5-7 in the questionnaire were about students' mathematics study habits before class. It was found that more students reviewed their mathematical knowledge before class and previewed new mathematical knowledge, while some students turned to their notebooks to review the content or preview new knowledge before class only when the teacher explicitly asked them to do so or when there would be a relevant test in the next class. In addition, there were a few students who could not actively prep for new knowledge and review old knowledge before class, whether the teacher required it or not. Most of the students were actively prepared for the preparation before the math class, and few of them could not manage to prepare their school supplies.

3.2.3 Rural junior high school students classroom mathematics study habits survey results analysis

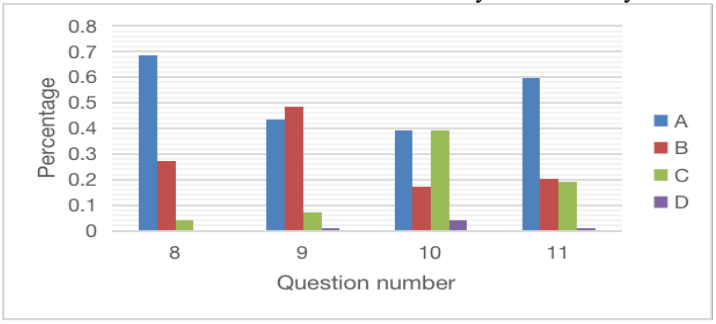

Figure 3. Analysis of the survey results of pre-class mathematics learning habits of rural junior high school students

Questions 8 - 11 in the questionnaire are about students' classroom mathematics study habits. In terms of classroom listening, nearly 70% of the students could listen carefully in class, and less than 30% of the students needed a lively classroom to participate in it. However, there are still some students who choose to give up mathematics because of their poor mathematics foundation and do not listen to the class at all. About 45% of students can actively participate in classroom discussions and speak up in terms of classroom participation.

There are also nearly 50% of students who can actively participate in classroom discussions but are afraid to share their own or their group's results, perhaps because they are not confident, and there are some students who neither actively discuss nor speak up, lacking participation in the mathematics classroom. In terms of independent thinking in the mathematics classroom, nearly 40% of the students are used to independent thinking, and a very large proportion of students either directly wait for the teacher's explanation and analysis, or discuss with each other with their neighboring students, and will not actively think independently to analyze and solve problems. The survey also found that most students develop the habit of active note-taking. Only nearly 20% of the students would take notes without being reminded by the teacher. 14% of them only knew how to mechanically write down what the teacher said in class, but did not know how to take notes in a scientific way, which instead reduced the efficiency of the class. There is also a small group of students who go to the other extreme and do not take notes at all, so that they do homework and review after class, without any evidence.

3.2.4 Analysis of rural junior high school students after-school mathematics study habits survey results

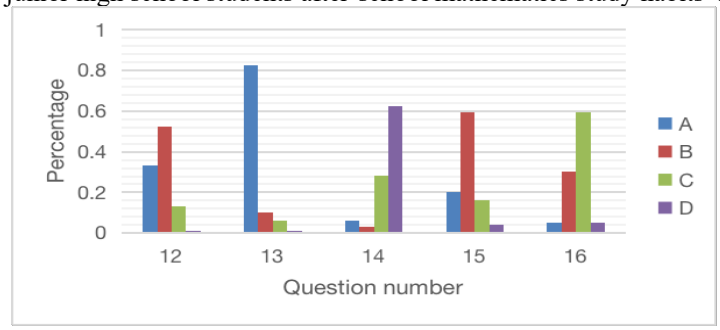

Figure 4. Analysis of the results of the survey results on the after-school mathematics learning habits of rural junior high school students

Questions 12 - 16 in the questionnaire are about students' mathematics study habits after class. In terms of note review, most of the students were able to review their notes after class according to their own situation, but there were still many students who did not actively review their notes. In terms of completing homework independently, most students can complete their homework carefully, and fewer students need to be reminded by teachers and do not complete their homework. In the face of not being able to do the after-school homework, most students either drilled themselves or asked their classmates and teachers for leave, and fewer students had the poor habit of directly copying the answers or not doing it. For most students, the "correction note" is a sham. Even if they organize the wrong problems, they just copy the examples in the book again to cope with the teacher's inspection. Few students will do the wrong problems independently and completely.

3.2.5 Analysis of the results of the survey on rural junior high school students' motivation, self-motivation, interest and confidence in learning mathematics

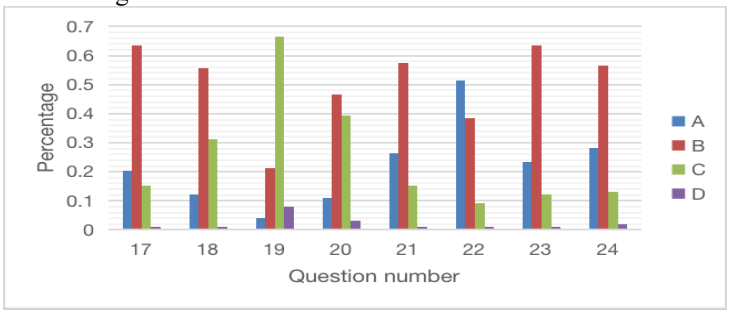

Figure 5. Analysis of the results of rural junior high school students' motivation, self-awareness, interest, and confidence in learning mathematics well

Questions 17-24 in the questionnaire are about students' motivation, self-motivation, interest and confidence in learning mathematics. In terms of examining problems, nearly 20% can do so carefully, 65% of the students can do so often, and a small number of students cannot do so. In terms of solving problems, most students do not like to study difficult problems and give up when they encounter them. In terms of linking old and new knowledge, most students can still make the connection between the two, while fewer students cannot. Students are still independent and self-motivated in terms of independence in evening self-study. In terms of interest in mathematics and confidence in learning mathematics well, the majority of students are interested and confident.

3.2.6 Attention of parents of rural junior high school students to their children's learning

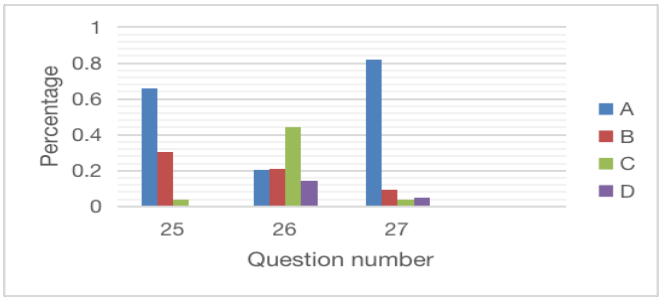

Figure 6. Parents of rural junior high school students pay attention to their children's learning

Questions 25 - 27 investigated how concerned parents are about their children. Most of the students' parents are still concerned about their students' learning, and more of them are not only concerned about their grades. In terms of home learning environment, there were parents who were able to provide a quiet learning environment for their students. Still, there were also cases where parents constantly harassed their students about their studies. Finally, the vast majority of parents get along well with their children, and there are other factors where some students do not have a friendly relationship with their parents, but only some.

4 Rural junior high school students mathematics study habits influence factors analysis

Through the above survey on the mathematics study habits of rural junior high school students, we can find that most rural junior high school students' mathematics performance is in the middle and lower reaches. Many students lack good mathematics study habits, and some bad mathematics habits are difficult to change. Therefore, with the help of interview questionnaire design, we tried to find the influence factors of mathematics habits in rural junior high school. Next, we seek the factors that influence students to form good mathematics study habits from three perspectives: rural junior high school students themselves, their teachers, and their home environment.

4.1 Analysis of students' own factors

Student interviews

During the interviews, three students from Grade 7 of the school (one excellent student in mathematics (A), one intermediate student in mathematics (B), and one disadvantaged student in mathematics (C)) were selected as representatives of the school.

Table 2

Question	A	B	C
Do you take the initiative to study before a new lesson or do you study only when the teacher assigns you to do so?	Active pre-study	Teacher assigns	Pre-study only when assigned by the teacher
Before each math class, do you take the initiative to review what you have learned or only when the teacher reminds you?	Active review	Review only when reminded by the teacher	Review only when reminded by the teacher
What is your general state when you are in math class?	Listening carefully to the lecture	Listening attentively	Occasionally distracted by other things
In math class, can you pay full attention to the lecture?	Can listen to lectures with full concentration	Yes	Sometimes not
What is your general state toward the questions asked by the teacher in the math lecture?	Independent thinking state	Thinking	Group thinking
Do you have the habit of taking mathematical notes in mathematics class and how do you do it?	Remember the main points of knowledge	Take notes on key knowledge	No
What is your usual review of math?	Review math carefully	Review sometimes	Go through previous notes
Do you ask for help when you don't know how to do your homework after class? To whom do you ask for help?	Actively seek help, usually from teachers or classmates	Actively seek help, usually from teachers and classmates	Yes, ask classmates

Question	A	B	C
Do you have the habit of making a collection of wrong questions?	Always	Seldom	No
Do you think good math habits are important for your own learning?	Very important	Has an impact	Should be important
What do you think are some good math habits you have?	Pre-learning before class and revision after class	Active pre-study; note taking	Write assignments frequently

Analysis of the reasons for students' poor mathematics study habits

One is whether the student is intelligent or not. Most people try to deny that individual intelligence affects academic performance for irrational purposes, but in reality we cannot deny the existence of such factors. Second, the students' own personality characteristics, personality gaps determine whether secondary school students can be tough to overcome difficulties and have strong self-control in learning mathematics courses of different levels of difficulty. The third is the students' own emotional factors towards the teacher. Because secondary school students are developing emotionally, they are sensitive and vulnerable. Although they have rational thinking, they still continue to have a lot of emotional thinking, and the teacher's attitude will directly affect their attitude towards subject learning [2].

4.2 Teacher factor analysis

The teacher interviews were conducted with a number of experienced teachers in rural schools in the region. Results of faculty interviews are provided in table 4-2.

Table 3. Results of faculty interviews

Question	A	B
What are some of the details of your math curriculum that students actively prep before class?	Familiarize with definitions, familiarize with exercises	Read the book and search the information
Do your students prefer your lectures or lecture and practice in your math courses?	Lecture and practice	Lecture and practice
Do you initiate your own questions and what is your attitude towards students taking class notes in the course of your mathematics courses?	Require students to memorize class assignments	Yes, I agree
Do you correct your students' bad habits in a timely manner?	Yes	Yes
Do students ask you for help after class? What is your attitude towards students' wrong problems?	They will ask for help. I ask them to do the problem again after the second revision.	They will. I will answer the questions carefully and praise the students for asking for help.
What do you think are the specific influence factors on the formation of good mathematics study habits of students?	Environment, good education	Subjective motivation
What do you think is the best way to develop good mathematics study habits in secondary school students?	Start with the home and classroom environment	Long-term supervision
As a mathematics teacher, what do you think are the main elements of developing good mathematics study habits at the secondary school level?	Behavior, pre-study before class, timely consolidation	Pre-study before class and reviewing after class
What are some of the good mathematics study habits that you have taught your students in your previous mathematics classes?	Read problems three times before doing them, make a habit of correcting mistakes, and reflect on them every week.	Pre-reading
At what stage of the math class do you think it is most effective to teach students good study habits?	At the beginning of the class, it is a good time to teach students about habits.	Introduction of the situation

Question	A	B
What aspects of mathematics learning do you think are related to students' good mathematics study habits?	Checking and reasoning about computational problems in mathematics depends on the success of students' behavioral habits	Pre-study
Do you teach good mathematics study habits consciously and systematically in your mathematics classes or do you do it unconsciously and randomly?	Conscious and planned infiltration	Conscious and planned infiltration

We provide analysis of the reasons for students' poor mathematics study habits. First, the teacher's own knowledge base. Mathematics teachers are the most direct influencers of students' mathematical habits, and their teachers' own standards will directly affect secondary school students' mathematical learning outcomes. Therefore, teachers should be proactive in understanding the frontier knowledge related to mathematics subjects in addition to their own teaching tasks. In addition, teachers also have a comprehensive knowledge of teaching psychology, new teaching materials, new models, and other related knowledge to be well-informed. Second, the teachers' use of a divergent and multidimensional teaching approach is widely recognized among teachers and well received among students in the development of mathematics curriculum teaching for secondary school students. Third, the teacher's rigorous teaching attitude, the teacher in the teaching process to ensure a rigorous and responsible attitude, to achieve continuous adjustment of the classroom teaching model, can affect the students' goodwill towards the teacher, but also very easy to cause the teacher to lose prestige influence within the students. Therefore, teachers need to ensure a scientific and rigorous teaching attitude, so that they can resist temptations outside the classroom, focus students' attention and encourage them to be active learners, and set a good example. Fourth, mathematics teachers pay attention to mathematics study habits or not. Under the pressure of junior high school entrance, teachers put too much emphasis on the final grade and therefore favor problem solving. They think that students become difficult students because they have poor foundation or mathematical thinking and ignore the influence of mathematics study habits on them students.[2]

4.3 Influence of family factors

Results of parent interviews are provided in table 4-3.

Table 4. Records of parent interviews

Question	A	B
How long does your child usually spend on studying after coming home?	1.5 hours	About 1-1.5 hours after school each day
How long does your child usually stay focused?	1 hour	30 minutes
Do you usually accompany your child to do homework? How long do you stay with your child for each time?	Sometimes yes, sometimes no, about 1 hour	Yes, about 1 hour
Do you pay attention to your child's hobbies and interests? How long do you stick to each hobby?	Watching TV, 2-3 hours	Yes, but not for long
Does your child procrastinate during homework?	Yes	Occasionally
Does your child make a study plan according to his or her situation? Does your child choose to study or have fun at home first?	No, they study and then play	Yes, both
Does your child make small movements in the learning process? If yes, what kind of small movements do you mean?	Sometimes they do, sometimes they don't. They stop and play.	Yes, looking around
Who does your child usually ask for help when he or she encounters a problem in school?	He will search Baidu by himself	Classmates, teachers
What do you think is the importance of good mathematics study habits for your child's learning?	Pre-learning in advance, paying attention in class, and practicing after class to brush up on problems	Good study habits can make your child want to learn and take the initiative to learn.

Question	A	B
What other good study habits do you know about your child?	Now my child wants to learn, but the foundation of elementary school is poor, he will review the basic knowledge of elementary school by himself.	He takes the initiative to finish his homework
Do you plan to train students to form good study habits next? How do you plan to cultivate them?	Pre-learning in advance, paying attention in class, practicing after class, asking questions if you don't understand	Yes, do a good study plan, take the initiative to complete homework, read more and do more
Do you have regular contact with teachers at school? What is the main method of contact? Who is usually more active? What aspects of the student's life are the main focus of communication?	Rarely, by phone, by myself, in terms of learning	Occasionally, by phone, parents, study
What are your expectations and suggestions for teachers to develop good mathematics study habits in students? What are your thoughts on home-school cooperation?	Expect to give the child some pressure, such as after-school exercises, different types of questions. Parents want their children to study well.	Expect the teacher not to retain knowledge and to give the child a good study plan and habits.
What do you think is the current advice for teachers in developing good mathematics study habits in students?	Pre-read in advance, pay attention in class, practice after class, and ask questions if they don't understand.	I hope the teacher will urge my child to adhere to good study habits and study plans.

We provide the analysis of the reasons for students' poor mathematics study habits. First of all, the students' demanding attitude toward mathematics study habits held by parents. In rural areas, for their own reasons, parents are more concerned about the improvement of grades than the cultivation of good study habits. They one-sidedly notice only the ups and downs of mathematics grades and care only about which part of the lesson their children did not understand. Still, they do not notice whether their children's mathematics study habits are not good enough. Second, parents' ability to develop their children's mathematics study habits is inadequate. Each family has a different parenting style and teaching style. Compared with urban parents, parents of rural junior high school students are not able to give good guidance to their children's mathematics study habits due to various reasons, life experiences and their own inability. Finally, the strict level of parental discipline. In order to make a living, many parents in rural areas just let their children's grandparents take care of their children, and lack communication with their children themselves, and do not accompany their children during the critical period of habit formation. Some parents only pay attention to verbal instruction and neglect the power of teaching by example, demanding the best from their children, but failing to lead by example when supervising them.

5 Rural junior high school students mathematics study habits cultivation strategies

Based on the results of the survey data and interviews above, the factors that affect the formation of good mathematics study habits in rural junior high school students are analyzed. Accordingly, this paper proposes some corresponding adjustment methods through three perspectives of students, parents and teachers, respectively, from pre-class habits, classroom habits and post-class habits.

5.1 Students' own perspective

As the main body of mathematics study habits, students need to rely on their own strength to change the status quo, and the help from other parties can only play a supplementary role. First of all, students should correct their learning attitude, set appropriate goals, and change themselves slowly by starting with small, easy-to-achieve simple goals in goal setting and accomplishment, step by step.

1. In terms of pre-class habits, students need to recognize the importance of pre-reading before class. Pre-learning in advance can help them focus on listening to the areas they do not understand in class, can deepen their understanding of knowledge, can change from passive acceptance to active acceptance, and ensure coherence in classroom listening.
2. In terms of classroom study habits. First, the classroom should be a habit of following the teacher closely. This requires students to be able to pay attention, reduce the time of distraction and daze, and be able to follow thinking, memorizing, and reflecting, so that they can belong to effectively following the teacher's ideas. Secondly, there is the habit of taking notes. Students can take notes on all of the teacher's board or selectively according to their own habits. But for the key knowledge points or the contents that do not appear in the textbook,

students should take notes in time. And the habit of taking notes cannot be missing is the habit of going through the notes from time to time, especially when reviewing, to check the notes.
3. In terms of after-school study habits. First of all, it is important to be quiet and to be free from distractions. Making good use of fragmented time can make doing problems much more efficient. Second, students should summarize what they have learned each day. Before going to bed, students should go over what they have learned throughout the day, which helps a lot in remembering the points. Third, to take the initiative to ask questions. When students encounter a place they can't, they ask themselves first, find the connection between the problem and the conditions of the topic, explore according to this clue, and then look at the reference answers, and figure out every cause and effect. When neither self-questions nor answers can be solved, students should ask their classmates or teachers and strive not to accumulate problems every day. And in the process of problem solving, master the knowledge learned. When encountering problems, students should ask more questions, so as to know both the surface phenomenon of things and the essence of things and their causes.

5.2 Teacher perspective

Teachers are key players in the process of helping students develop good study habits. Teachers can influence students' study habits in every word and action. Specific suggestions for adjustments are the following three points:
1.Make students aware of good habits. Since many rural junior high school students do not have specific enough knowledge about habits, it is important to adjust the mathematics study habits of rural junior high school students. First, teachers should let rural junior high school students know what good habits there are in mathematics study and let them understand the importance of good mathematics study habits for learning mathematics.
2.Cultivate good habits before it's too late, step by step cultivate students' good study habits should be the earlier the better. When people accept new things or enter a new environment, they tend to maintain a strong enthusiasm and have a high receptivity. At the same time, cultivating good habits is to teach according to students' abilities. Different students have different characteristics, and it is necessary to combine specific teaching requirements according to students' age characteristics, so that students' good mathematics study habits can be developed sustainably from small to large.
3. Teachers need to be persistent. "No accumulation of steps, can't lead to thousand miles. No integration of streams, can't result in seas and oceans." The development of mathematics study habits also requires persistence and persistence. At the same time, in terms of the cultivation of students' mathematics study habits, teachers should plan and set the corresponding requirements for students in the usual teaching process. By taking into account the actual situation of each lesson, they should prepare the lesson carefully, instruct carefully, and check carefully, so that more students can experience the benefits of good mathematics study habits. Teachers should pay more attention and patience in dealing with the advanced students in the class.

5.3 Student parent perspective

The family has an important influence on the development of a child's study habits and the development of his or her character and personality. Although schooling is a key factor in a child's development, home tutoring is even more important to a child's growth. In terms of family, students' values can cultivate good mathematics study habits in the following ways:

Develop good habits with your child. Parents can review with their children, look at the book, let your child talk about the main content of what the math teacher said that day, ask some thoughtful questions about the content of the course for your child to answer, or come up with some example problems for students to do. Especially the students with poor foundation can gradually catch up if they can master the basics in the textbook and then gradually improve. For independent completion of homework, parents should let their children complete it independently and supervise and check it after completion without having to do it.

Develop an attitude and habit of spontaneous learning. To enable students to learn spontaneously and actively, which must be developed with a long-term training. During the child's study time at home, parents should provide a quiet space for the student to study as well as a role model for learning. Parents can read and study in other areas of the home while their children are studying to create a good home learning atmosphere.

Conclusion

The formation of study habits is particularly important for people's life and learning, not only for students' learning, but also for their growth and their future in society. In this paper, a questionnaire survey and interviews were conducted to understand the teachers, students, and parents of students in a rural middle school in a region of China. Based on the principles of cultivating students' good mathematics study habits, we analyzed the current situation of mathematics study habits of secondary school students in this survey.:
(1) The survey shows the current status of the formation of study habits among secondary school students, which

leads to the judgment that most students have not formed proper study habits at the present time.
(2) According to the interviews, the main factors that influence the formation of good mathematics study habits of secondary school students include the students themselves, teachers and parents. Students' own factors: lack of self-awareness, limited individual experience leading to the development of good study habits, the importance of study habits. Teachers' factors: teachers' attention, teachers' energy and patience, etc. Parents' factors: parents' attention, parents' ability to cultivate, parents' ability to discipline, etc.
(3) In response to these influences, some adjustments were proposed: in terms of learning and teachers, attention should be paid to the development of secondary school students' habits of pre-reading, listening in class, reviewing after class, and thinking about diffusing mathematical reading. Parents should start the cultivation of their children's mathematics study habits at an early age and teach them by example, and most importantly, students themselves should realize the importance of habits, be able to attribute them correctly, and be determined to change themselves. In conclusion, whether it is the formation of habits by the struggling students themselves or the training by teachers' parents, it is necessary to cultivate them from small things, cultivate them as early as possible, and form good mathematics study habits through repeated training exercises.
There are also many shortcomings in this study. Due to the lack of my own professional theoretical level, there are still many parts of this thesis that can be improved. How to cultivate students' good mathematics study habits will be a question that I have been thinking about and seeking answers for the whole teaching career. The author will continue to explore and accumulate experience in teaching in the future.

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Appendix I Questionnaire on the Status of rural junior high school students mathematics study habits in China

Dear Students:
Hello! In order to help you develop better mathematics study habits and improve your performance in mathematics, we are going to conduct a survey on mathematics study habits. This survey will take you about 3-5 minutes. This questionnaire is anonymous and the information you provide is absolutely confidential. The answers you provide are not right or wrong, please try to answer all the questions according to your actual situation, thank you very much for your participation!
1.Your gender is（ ）
A.Male B. Female
2.What is your math grade level in the class.（ ）
A. Excellent B. Moderate C. Poor
3.Do you think study habits have a big impact on academic performance?（）
A. Very large B. Relatively large C. General D. No effect

4.How do you think your mathematics study habits are?（）
A. Very good B. Relatively good C. General D. Relatively poor
5.Do you take the initiative to pre-study before a new lesson? ( )
A.Able to persist in pre-study B. Pre-study only when assigned by the teacher
C. Rarely can D. Never pre-study
6. Do you review your old knowledge before each math class? ( )
A.. Can before every class B. Can only when reminded by the teacher
C. Rarely D. Never
7. What is your general state before going to math class?
A. Prepare relevant study supplies and rest in position.
B. Prepare the necessary school supplies, but will not rest in your seat.
C. Do not prepare anything, but enter the classroom a few minutes before class.
D. Do not make any preparation before class and enter the classroom with the bell.
8. When you are in math class, can you pay attention to the lecture? ( )
A. Every class B. Only when the teacher speaks vividly.
C. Very rarely can D. Never
9. When the teacher asks the students to discuss in groups in class, what do you do? ( )
A. Actively discuss and take the initiative to speak each time
B. Actively discuss but do not speak
C. Occasionally participate in the discussion
D. Never participate in the group discussion
10. Think about mathematics class, the teacher asked the question, you are most consistent with: ( )
A. Always think independently B. Occasionally think
C. Discuss the answer with students
D. Be silent and wait for the teacher to explain
11. During the class, do you have the habit of taking notes? How do you take notes? ( )
A. Write down the main points, examples and exercises of the answer process
B. Write down word by word
C. Only when the teacher reminds me to take notes
D. Never do it
12. Your usual review situation is: ( )
A. Can check the notes on the same day, memorize the main points, and review them later in time
B. Can review on the same day with the notes, memorize the main points, and then review only before the exam
C. Do not review on the same day, but only before the test
D. Never revise
13. Are you able to complete your homework independently? ( )
A. Every time B. Only when the teacher reminds me C. Very rarely D. Never
14. Do you often not do your math homework? ( )
A. Often B. Need teacher's supervision C. Occasionally D. Never
15. When you can't do your homework after class, what will you do? ( )
A. Study hard until I get it done.
B. Wait until the next day to ask classmates or teachers
C. Directly leave blank, do not do
D. Directly copy the answer
16. Do you have the habit of insisting on doing the wrong questions again in the error book? ( )
A. Always do so B. Often do so C. Rarely do so D. Never
17. When solving a problem, do you examine it carefully? （ ）
A. Always do so B. Often do so C. Rarely do so D. Never
18. If I find it difficult to solve a mathematical problem in one way, I try to learn it in a different way.（ ）
A. Always do so B. Often do so C. Rarely do so D. Never
19. You are afraid to do difficult problems and do not like to study them ( )
A. Always do so B. Often do so C. Rarely do so D. Never
20. You will connect, compare, and summarize old and new knowledge（ ）
A. Always do so B. Often do so
C. Rarely do so D. Never
21. You can study hard during the evening study.
A. Always do so B. Often do so
C. Rarely do so D. Never

22. You study math because ( )
A. It is interesting to learn mathematics
B. The pressure of learning to test, practical value
C. Without being criticized by teachers or parents
D. I have given up mathematics
23. Do you think math is hard? Do you have the confidence to learn math well? ( )
A. Not difficult, have confidence to learn well
B. A little difficult, have confidence to learn well
C. Very difficult, not confident to learn well
D. Extremely difficult, don't learn
24. Do you like math?
A. Like it very much B. Like it some C. Have no feelings D. Hate it
25. Do your parents or family members ever ask you about your academic performance or study status? ( )
A. Frequently asked and cared, not limited to grades
B. Frequently asked and cared, but only grades
C. Occasionally ask D. Never ask
26. When you study at home, your parents are afraid of affecting your study, will quietly hide in a place you can not see for other things? ( )
A. Every time they can B. Often C. Sometimes D. Never
27. How do you think the relationship between you and your parents is? ( )
A. Get along well B. Dictatorial and rough
C. Accommodating and spoiling D. Don't care much

Appendix II Rural junior high school students interview questionnaire for mathematics study habits development

Hello, dear students! We are completing a survey on the current situation of cultivating good mathematics study habits among rural middle school students. In order to understand the current situation of mathematics study habits of junior high school students in rural areas, we are conducting this interview survey and hope that we can get your participation to provide a reliable basis for the completion of my work and the development of first-line mathematics teaching. This survey will be anonymous and will not reveal your personal privacy. We also hope to find effective ways to cultivate good mathematics study habits of secondary school students through this survey! Thank you for your cooperation and help!

1. Do you take the initiative to study before a new lesson or do you study only when the teacher assigns you to do so?
2. Before each math class, do you actively review what you have learned or do you do it only when the teacher reminds you?
3. How do you usually feel when you are in a math class?
4. When you are in math class, can you pay attention to the lecture with all your heart and soul?
5. How do you feel about the questions you are asked in mathematics class?
6. Do you have the habit of taking notes in mathematics class?
7. How do you usually review mathematics?
8. When you can't do your homework after class, do you ask for help? Who do you ask for help?
9. Do you have the habit of making a collection of wrong problems?
10. Do you think good mathematical habits are important for your study?
11. What do you think are some good mathematical habits you have?

Appendix III Interview questionnaire of rural junior high school teachers on the development of students' mathematics study habits

Dear Teacher! Hello! We are completing a survey on the current situation of cultivating good mathematics study habits among rural middle school students. We hope to get your participation and help me to complete my work and provide a reliable basis for the first-line mathematics teaching work. This survey will be anonymous and will not reveal your personal privacy. We also hope to find effective ways to cultivate good mathematics study habits of secondary school students through this survey! Thank you for your cooperation and help!

1. What are the details of your mathematics courses in which students take the initiative to pre-study before class?
2. Do students prefer your lectures or practice in your mathematics courses?
3. Do you take the initiative to ask questions and take notes during your mathematics courses?
4. Do you correct students' bad habits in a timely manner?
5. Do students ask you for help after class? What is your attitude towards students' mistakes?
6. What do you think are the specific influence factors on the formation of students' good mathematics study habits?
7. What do you think is the best way to develop good mathematics study habits in secondary school students?

8. What do you, as a mathematics teacher, think are the main elements of developing good mathematics study habits at the secondary school level?
9. In your previous mathematics classes, what have you taught your students about the development of good mathematics study habits?
10. At what stage of the mathematics class do you think it is most effective to teach students good study habits?
11. What aspects of mathematics learning do you think are related to students' good mathematics study habits?
12. Do you teach good mathematics study habits in your mathematics classes consciously and systematically or unconsciously and randomly?

Appendix IV Interview questionnaire of rural junior high school students on students' mathematics study habits cultivation

Dear parents and friends, hello! Thank you for your participation and cooperation in this survey, which is not only the concern for children but also support my work. Parents as the first teacher of children, parents in the child's growth path of enlightenment is of vital importance, family education is pivotal. As the guide of children's growth, teachers can only help children to develop in an all-round way if they can truly integrate school, family and society. Therefore, I sincerely hope that this survey will receive the support of parents. For secondary school students' mathematics learning, the focus is on cultivating good study habits. Then we will start the following interview survey on students' view of mathematics learning. Thank you again for your cooperation.

1. How long does your child usually spend on studying after he/she comes home?
2. How long does your child usually stay focused?
3. Do you usually accompany your child to do homework? How long do you spend with your child each time?
4. Do you pay attention to your child's hobbies and interests? How long do you stick to each hobby?
5. Does your child procrastinate during homework?
6. Does your child make a study plan according to his or her own situation? Does your child choose to study or play first at home?
7. Does your child have other activities during the study process? If so, what are the specific activities?
8. Who do your children usually ask for help when they encounter problems in their studies?
9. What do you think is the importance of good mathematics study habits for your child's learning?
10. What other good study habits do you know your child has?
11. Do you plan to cultivate good study habits in your students next? How do you plan to do so?
12. Are you in regular contact with teachers at school? What is the main method of contact? Who usually takes the initiative? What are the main areas of communication with students?
13. What are your expectations and suggestions for teachers to train students to develop good mathematics study habits? What do you think about home-school cooperation?
14. What do you think are your suggestions for teachers to cultivate good mathematics study habits in students?