
Strategies for Creating a Good Classroom Atmosphere in Senior High School Mathematics Class

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Abstract – Under the background of the new curriculum standard, the aim of senior high school mathematics course is to really change students' learning style, arouse students' subjective consciousness, give full play to students' subjective role, and make "autonomy, cooperation and exploration" achieve practical results. However, the actual teaching effect is not as desired. The classroom is still the stage for a few excellent students, but most students are unknown. Therefore, creating a good classroom atmosphere is the key to senior high school mathematics teaching. Through the investigation, it is found that the participation, order and communication effect of the current senior high school mathematics classroom are not ideal. So the strategies to create a good classroom atmosphere are as follows: taking students as the main body of the stage and giving full play to their individual characteristics; creating a democratic atmosphere with open ideas; using advanced educational technology to enhance interestingness.

Keywords – Classroom Atmosphere, Senior High School Mathematics, Strategy Research.

I. INTRODUCTION

General Senior High School Mathematics Curriculum Standard (Experiments) puts forward that in the senior high school mathematics classroom teaching, teacher's teaching is still one of the important teaching methods, but we must pay attention to the student's main participation, teacher-student interaction. General Senior High School Mathematics Curriculum Standard (2017 Edition) further clarifies that teachers should focus on promoting students' learning in classroom teaching activities, actively explore diversified teaching methods conducive to promoting students' learning, not only limited to teaching and practice, but also include guiding students to self-study, independent thinking, hands-on practice, autonomous exploration, cooperation and communication, etc. [1]. It can be seen that the new curriculum standard puts forward higher requirements for all senior high school mathematics teachers. How to let students obtain the best learning effect and create a good classroom atmosphere has become a problem that many teachers think about. Therefore, teachers should adhere to the concept of knowledge focusing on thinking process, life experience, open construction and overall connection, advocate the learning concept of initiative, communication, innovation and experiential learning and transform their roles into the creators, participants, collaborators and motivators of students' effective learning, so as to create a positive classroom atmosphere of teacher-student interaction and students interaction, and create a people-oriented classroom learning environment.

II. CONCEPT DEFINITION

To explore the classroom atmosphere, we should first understand the connotation of the atmosphere. "Atmosphere" in Xinhua Chinese Dictionary refers to the surrounding emotional appeal. The classroom atmosphere refers to a stable and positive emotional experience formed by teachers and students in teaching activities and a comprehensive reflection of their attitude and behavior towards teaching activities [2]. It is an

important factor for the smooth progress of classroom teaching. Because of its curriculum orientation and specialty, mathematics teaching in senior high school has higher requirements for classroom atmosphere. Generally speaking, classroom atmosphere can be measured by participation, order and communication effect, which can be divided into three types: positive, negative and confrontational. The quality of classroom atmosphere directly restricts and influences the psychological compatibility and emotional interaction between teachers and students, students and students, as well as the teaching process and effect.

III. SURVEY ON THE CURRENT SITUATION OF MATHEMATICS CLASSROOM ATMOSPHERE IN SENIOR HIGH SCHOOL

A. Implementation of the Investigation

In order to understand the current situation of senior high school mathematics classroom atmosphere in detail, 142 students and 60 teachers in No.2 Middle School of Yanji City, Jilin Province, were investigated by questionnaire. The questionnaires for students were issued 142, which randomly selected students of different grades and different gender. 137 samples were recovered with a recovery rate of 96.5%; 128 valid questionnaires with an effective rate of 93.4%. The questionnaires for teachers were issued 60, covering mathematics teachers of different nationalities, titles, career stages and gender. 60 Samples were recovered with a recovery rate of 100% ; 57 valid questionnaires with an ineffective rate of 5%.

B. Survey Data Processing and Analysis

1. The Student Part

Students' questionnaires mainly reflect the current situation of senior high school mathematics classroom atmosphere through three aspects: Students' views and feelings on participation in mathematics classroom; Students' views and feelings on order of mathematics classroom; Students' views and feelings on the communication effect in mathematics classroom. The specific findings are shown in Table I-III.

Table I. Students' Views and Feelings on Participation in Mathematics Classroom (%)

| Title\Option | Very consistent | Consistent | Tolerable | Inconsistent | Very inconsistent |
|---|-----------------|------------|-----------|--------------|-------------------|
| Teachers' monologue teaching does not take up too much time | 0.00 | 23.34 | 22.22 | 21.11 | 33.33 |
| Attention is concentrated in class | 50.00 | 31.48 | 12.94 | 5.58 | 0.00 |
| Asking questions to teachers in class | 3.70 | 5.96 | 18.35 | 31.28 | 40.71 |
| Be able to answer teachers' questions timely in class | 12.96 | 42.59 | 20.22 | 18.53 | 5.70 |

From Table I above, we can see that although the new curriculum reform is going deeper and deeper, senior high school students have been influenced by traditional education methods in primary and junior middle schools. Even in senior high school, 76.66% of students are still used to what the teachers say and the students listen, and senior high school mathematics teachers are also used to "a blackboard, a chalk" way of lecturing; while 75.77% of the students can interact with the teacher in time and answer the questions raised by the teacher, there are still 90.34% of the students who cannot raise questions to the teacher and will not express their opinions even if they have questions. Some senior high school students have bad psychological tendencies, such as: excessive "face

son", afraid of others say love limelight and so on, so they are reluctant to speak even if they have ideas. Some students also have learning anxiety. Studies have found that classroom anxiety is negatively correlated with classroom atmosphere. The more anxious students are, the worse the classroom atmosphere will be. Excessive anxiety makes students nervous, fear and other psychological problems, so that the classroom atmosphere is negative and depressed. Therefore, the classroom has become a stage for a few outstanding students to demonstrate, but most students are unknown to the public and cannot participate in it better, the classroom atmosphere is naturally negative.

Table II. Students' Views and Feelings on Order of Mathematics Classroom

| Title\Option | Average | Variance |
|---|---------|----------|
| The teaching link is compact and the teaching structure is rigorous | 3.82 | 6.76% |
| This is a well-ordered class | 4.20 | 3.24% |
| Teachers do not have to spend much time maintaining discipline | 4.33 | 4.00% |

According to the data in Table II, senior high school mathematics teachers have compact teaching links and strict teaching structure with an average score of 3.82. It can be seen that teachers' teaching level and professional quality still need to be improved [3]. This also leads to individual students' lack of interest in mathematics learning in the classroom and weak sense of discipline, which mainly manifests in the following aspects: whisper, fidgeting, sleeping and so on, so that the classroom teaching atmosphere is severely affected; Senior high school students think that the average score of good class order is 4.20, the overall situation is ideal, variance is 3.24%, the data obtained is relatively stable. But there are also some senior high school mathematics teachers, especially the head teachers, who are not good at class management, which make some classes have a negative classroom atmosphere and a poor learning atmosphere.

Table III. Students' Views and Feelings on the communication effect in mathematics classroom

| Title\Option | Average | Variance |
|--|---------|----------|
| Understanding the learning objectives of this class | 3.94 | 1.68% |
| Understanding what you are trying to achieve in this class | 3.96 | 1.64% |
| Be able to grasp the teaching content in class as much as possible | 4.11 | 1.44% |
| Students benefit a lot from discussing with each other | 2.88 | 1.96% |

Table III shows that the average scores for students to understand the learning objectives of this class and to master the contents of this lesson perfectly are 3.94 and 4.11 respectively, with lower scores. The variance is 1.68% and 1.44% respectively, which indicate that the obtained data are relatively stable. They also fully show that in the senior high school mathematics classroom, the process and results of students' communication are not ideal, they cannot grasp knowledge and skills better, and it is more difficult to form and develop the core literacy of mathematics. In fact, teachers and every student are the active elements to accomplish the classroom goals and tasks. In mathematics classroom teaching, teachers should act as "navigators" to truly assist and serve students in "paddling". That is, to grasp the essence of mathematical content and inspire students to think, so that students can get more "communication" and "participation" in learning, and create a positive atmosphere in mathematics classroom [4].

2. The Teacher Part

Teachers' questionnaires are designed mainly from internal and external factors: internal factors mainly refer to teachers' teaching methods and role positioning; external factors mainly refer to educational technology. The statistical results of the questionnaire are shown in Table IV.

Table IV. Teachers' Practical Classroom Teaching Situation (%)

| Title\Option | Very consistent | Consistent | Tolerable | Inconsistent | Very inconsistent |
|---|-----------------|------------|-----------|--------------|-------------------|
| "Teacher lecturing" is the main method in class | 59.48 | 28.11 | 6.56 | 3.20 | 2.65 |
| Choosing the teaching content only according to the hotspot of college entrance examination | 46.30 | 33.33 | 12.96 | 3.70 | 3.70 |
| Be good at introducing new lessons from the reality of life | 48.15 | 30.48 | 21.35 | 0.02 | 0.00 |
| Class ideas are clear, the key and difficult points are prominent | 79.62 | 13.81 | 6.57 | 0.00 | 0.00 |
| Be interested in mathematics questions asked by students in classroom | 35.04 | 55.93 | 21.11 | 16.21 | 2.75 |
| Multivariate interaction in classroom teaching | 19.62 | 29.21 | 31.16 | 19.96 | 0.05 |
| Often adopting arbitrary, controlled teaching style | 28.52 | 33.15 | 17.43 | 14.50 | 6.40 |
| There is more dignity and less affinity in class | 33.33 | 25.48 | 21.06 | 14.13 | 6.00 |
| Be able to treat every student in the class equally | 79.97 | 10.20 | 9.83 | 0.00 | 0.00 |
| Proficiency in Geo Gebra, Tuiti and other teaching software | 12.30 | 28.45 | 33.67 | 12.21 | 9.12 |
| Frequent use of multimedia and other auxiliary teaching equipment | 9.32 | 27.31 | 21.60 | 29.75 | 6.02 |

From questions in Sections 1-4 of the questionnaire, we find that 94.15% of senior high school mathematics teachers still adopt the traditional teaching method of lecturing. They just instill in students blindly, and do not make students desire to learn mathematics, which leads to the low level of students' participation in the classroom and the lack of communication methods [5]. The main reason for this phenomenon is the lack of cultivation of students' initiative in the way of education; 92.59% of teachers only choose the teaching content according to the hotspot of college entrance examination, pay more attention to the improvement of grades and ignore the students' feelings, and the teaching method gradually solidifies into a certain process in the long-term development. At the same time, when grades become the only criterion of evaluation, the emotional communication between students and teachers in the classroom will naturally decrease. From the 5-9 questions in the table above, it can be found that 79.1% of the teachers, due to their cognitive deviation of their roles, often in order to complete the teaching progress according to the requirements, mostly in the leading learning process, lack of teaching interaction with students. When teachers control the classroom with authoritative management means, students lose the ability to learn independently, creativity cannot be improved, and the classroom atmosphere gradually turns negative. Analysis of the results of 10-11 questions, we can see that educational technology lags behind the actual needs.

The reasons for the backwardness of teaching technology in some senior high schools come from two aspects: unreasonable allocation of funds and imperfect multimedia facilities in schools; passive learning attitude in teachers. When introducing new knowledge, teachers often neglect the construction of mathematical models in life. They are limited to the examples in books and lack the ability to supplement relevant knowledge with search engines.

IV. STRATEGIES FOR CREATING A GOOD MATHEMATICS CLASSROOM ATMOSPHERE IN SENIOR HIGH SCHOOL

A. *Taking Students as the main Body of the Stage and Giving Full Play to their Individual Characteristics*

In a good classroom atmosphere, senior high school students are often the main body of the teaching stage, which requires teachers to gradually change the teaching methods which are mainly lecture-oriented into diversified ways, such as the appropriate way to try the teacher-student conversation, student discussion, student activity and self-study tutoring. Teachers guide students to learn mathematics in a relaxed atmosphere, help students from the "reality of mathematics" to "do mathematics" by themselves and brain, collect data by observation, experiment, guess and other means, obtain experience, and make analogy, analysis, induction, gradually to achieve mathematicization and formalization [6]. In general, in the classroom of famous teachers, students often show active thinking and pleasant classroom atmosphere. This is mostly because these famous teachers are good at creating problem situations, guiding students to discuss with each other, giving full play to their personal strengths, and stimulating students' interest in learning mathematics.

B. *Creating a Democratic Atmosphere with Open Ideas*

In the process of classroom teaching, we should always focus on the teaching principle of "students as the main body, teacher as the leading", and teachers should not over-emphasize the role of their own managers, and devote themselves to solving the three major contradictions in mathematics teaching: "realistic background" and "formal model", "wisdom strategy" and "logical rigidity", "symbolic language" and "thinking level". At the same time, in order to ensure that teachers can better shape a positive atmosphere in the process of leading teaching, teachers' comprehensive quality should be improved. Firstly, mathematics curriculum needs to stimulate students' interest in learning mathematics, develop good learning habits, and promote the development of students' practical ability and innovative consciousness. Therefore, the classroom atmosphere should be open and inclusive. Teachers need to constantly adjust backward ideas, change the role of past managers, put down the mentality of command and order, and take a democratic way to give students more autonomy, so as to achieve the goal of comprehensively shaping students' quality and ability [7]. Secondly, cheerful personality and skillful use of body language are the premise of lively teaching process. Therefore, if teachers make good use of changeable eyes, rich facial expressions and appropriate walking and posture in the classroom, they can make the classroom atmosphere relaxed, happy and harmonious, so as to improve the teaching effect. Thirdly, senior high school mathematics teachers need to be familiar with basic knowledge of social and natural disciplines, form a "grand education concept" and create an open teaching situation for students.

C. *Using Advanced Educational Technology to Enhance Interestingness*

Practice has proved that teachers' guidance and students' subjective initiative can be better brought into play by

using the characteristics of fast information technology, image and timely feedback, which largely solves the three major contradictions in mathematics teaching, thus creating a relaxed and rich classroom atmosphere for students. Therefore, senior high school mathematics teachers should give full play to its media role and make more use of multimedia teaching systems such as GeoGebra, Tuiti, Authorware, Geometer's Sketchpad and Seewo Whiteboard to enrich the teaching form and content of senior high school mathematics so that the classroom is no longer single. At the same time, the application of advanced technology should also grasp the principle of interesting and exploratory, constantly guide and stimulate students' curiosity, so as to form a positive classroom atmosphere [8].

V. CONCLUSION

Senior high school mathematics classroom atmosphere is indeed a topic worthy of more people's attention, although it is the external form of the classroom, its advantages and disadvantages directly restrict and affect the exchange of information and emotion between teachers and students, even the teaching process and results. But at present, the democratic consciousness of senior high school mathematics classroom is extremely lacking, many front-line teachers are still deeply tied to the exam-oriented education stage, dare not take half a step; And students have been very tired of this traditional teaching mode and dull mathematics classroom [9]. Therefore, through this article, I hope that the majority of senior high school mathematics teachers can release all kinds of restraints, create a good classroom atmosphere for students, and guide students to understand the scientific value, application value, cultural value and aesthetic value of mathematics.

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