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Analysis of the Current Situation of the Integration of High School Mathematics and Information Technology Under the Core Literacy

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***Abstract* – With the development of information technology, the application of information technology has entered into various fields, with the help of information technology, efficiency and results have achieved a qualitative leap. At present, information technology and course teaching has been inseparable, for mathematics, the application of information technology to make abstract complex knowledge become image and concrete, make the class more interesting, to improve the students' interest in learning, students as the main body of the classroom, at the same time of learning knowledge mastered the basic skills of learning mathematics, also put forward for teaching a series of challenges. Through the survey found that in the high school mathematics classroom, becoming an information based society gradually and the combination of classroom teaching, most students prefer information technology classroom environment, it can be seen from the data information class students more participation, understanding of knowledge more specific and more solid, but there are also information technology application is difficult, the teaching focus is not prominent, students think time is insufficient, errors, using information technology instead of traditional teaching and other issues.**

***Keywords* – Information-Based Classroom, Inquiry-Based Learning, Information Technology.**

I. Introduction

Are mutually promote the common development of mathematics and information technology, the relationship between information technology high school mathematics teaching can be more convenient, the integration of information technology is more conform to the requirements of the mathematics subject core literacy training, with the help of the software, students are more intuitive, more clear understanding of the graphics of spatial structure, a deeper, more thorough understanding of the relevant mathematical concepts, more positive, more innovative explore the mystery of the mathematical subject more. Information technology, as a new culture, is bound to affect students' learning style and thinking.

II. Investigation on the Integration of High School Mathematics and Information Technology

A. *Implementation of the Investigation*

In order to understand the current situation of high school mathematics and information technology integration in detail, a questionnaire survey is conducted on 327 students and 47 teachers of no. 1 middle school in Antu county, Jilin province. A total of 327 questionnaires were distributed to students. Students of different grades and genders were randomly selected. 313 Copies were recovered with a recovery rate of 95.7%. There were 295 valid questionnaires, with an effective rate of 94.2%. Forty-seven questionnaires were distributed to teachers, covering math teachers of different nationalities, different professional titles, different career stages and different genders. 47 copies were recovered with 100% recovery rate. 45 Valid questionnaires, with no efficiency of 4%.

B. *Survey Data Processing and Analysis*

1. *The Comparison between Information-based Classroom and Traditional Teaching Classroom from the Perspective of Teachers*

The current situation of high school mathematics class is analyzed by teacher questionnaire mainly through three aspects: teacher's teaching task; Teachers' control over the classroom; Teachers' understanding of students' knowledge acceptance; the combination of teaching and cultivation of core qualities.

Table 1. Control of teachers in information-based classroom (%).

Title\Option	Very consistent	Consistent	Tolerable	Inconsistent	Very inconsistent
There are new ideas in classroom teaching	81.8	13.7	4.5	0.0	0.0
Guiding students to conduct cooperative inquiry in classroom teaching	72.7	18.2	9.1	0.0	0.0
Teachers can ensure a better classroom atmosphere	77.3	18.2	4.5	0.0	0.0
Teachers can lead the class better	36.4	27.3	22.7	9.1	4.5

Table 2. Control of teachers in traditional classroom teaching (%).

Title\Option	Very consistent	Consistent	Tolerable	Inconsistent	Very inconsistent
There are new ideas in classroom teaching	30.4	26.1	27.9	28.7	0.0
Guiding students to conduct cooperative inquiry in classroom teaching	60.9	21.7	8.7	4.3	0.0
Teachers can ensure a better classroom atmosphere	0.0	17.4	34.8	4.3	0.0
Teachers can lead the class better	56.5	34.8	8.7	0.0	0.0

As can be seen from the comparison between table 1 and table 2, teachers in different classes have differences in the creation of classroom content. 95.5% of teachers in the information-based class can make the class innovative through a large number of resources, more able to attract students' attention, and the classroom atmosphere is more active. Only 56.5% of the teachers in the traditional classroom think that their classroom is also full of new ideas, but the classroom atmosphere is somewhat dull. The traditional classroom and the information-based classroom form a sharp contrast.

Mathematics has abstractness, mathematics is the basic idea of mathematics abstract, abstracts the general law of graphics, the number and structure, when the students study mathematics, students have to through the

observation plane geometry and space imagination ability to understand and solve mathematical problems, these core literacy requires students through the appearance to look for the nature of inner link. With the help of information technology, drawing software can make the position relationship between geometries more clear, and through dynamic multi-directional display, students who have just been exposed to complex geometries can understand the spatial position more intuitively, reduce their resistance to mathematical learning and stimulate their interest. When understanding the trajectory problem, the trajectory equation of the point can be deduced through the formula, and the teacher can use the drawing software to reflect it in the image for dynamic display, so that students can have a more comprehensive understanding of the relationship between number and shape.

Mathematics is the combination of abstract and concrete, using a large amount of mathematical symbols in mathematical disciplines, these symbols make mathematical language, concise and vivid, and represents a specific meaning, each math concepts, definitions, terminology, symbols and letter combinations are represents the different meaning, these mathematical language contains a mathematician of unremitting efforts, behind every great mathematical conclusions have write the story full of hardships. For high school students, mathematics should not be copied from these conclusions, but also should understand the story behind it, understand the charm of mathematics. In the era of "interchange network +", it is very easy to find information. However, due to heavy schoolwork, students tend to lose their curiosity about learning and are only trapped by abstract concepts, but ignore the interesting aspects. Therefore, as teachers during the teaching, through the Internet platform, the difficult to understand, hard to accept the story behind the concepts and definitions, students can also through the network access to relevant data, share the interesting story, students not only understand the concept of difficult, also know the story behind, understand now learn knowledge has not come easily, have improved in thoughts and learning.

According to the data in table 1 and table 2, 63.7% of teachers in information-based class can lead the class, while 91.3% of teachers in traditional class can lead the class. Information-based classroom poses great challenges to teachers. Teachers should focus on guiding students to explore independently without going off topic. Therefore, it is difficult for teachers with less experience to give full play to the advantages of information-based classroom. However, in traditional classrooms, teachers' extensive explanation combined with students' exercises leads to better classroom leadership than information-based classrooms.

Table 3. Survey on teaching tasks of teachers in information-based classroom (%).

Title\Option	Very consistent	Consistent	Tolerable	Inconsistent	Very inconsistent
A large amount of teaching resources should be prepared before class	81.8	18.2	0.0	0.0	0.0
Multimedia is often used to introduce new lessons	77.3	22.7	0.0	0.0	0.0
You need a lot of explanation in class	36.4	22.7	31.6	9.1	0.0
The class thought is clear, the key difficult point is outstanding	68.2	27.3	4.5	0.0	0.0
The content can be targeted at different levels of students	31.8	27.3	36.4	4.5	0.0

Table 4. A survey of teaching tasks of teachers in traditional classroom teaching (%).

Title\Option	Very consistent	Consistent	Tolerable	Inconsistent	Very inconsistent
A large amount of teaching resources should be prepared before class	39.1	26.1	26.1	8.7	0.0
Multimedia is often used to introduce new lessons	21.7	17.4	23.1	47.8	0.0
You need a lot of explanation in class	91.3	8.7	0.0	0.0	0.0
The class thought is clear, the key difficult point is outstanding	65.2	30.5	4.3	0.0	0.0
The content can be targeted at different levels of students	78.3	13.0	8.7	0.0	0.0

As can be seen from table 3 and table 4, information-based classroom also poses greater challenges to teachers. 81.8% of teachers need to prepare a large amount of teaching resources and have a heavy workload of lesson preparation. For teachers who like to create traditional classes, the majority of them are experienced old teachers, and only 39.1% of them think that they need to do a lot of teaching preparation, and the expected classroom effect can be achieved through a lot of teacher's explanation in class. Whether in the information-based classroom or the traditional classroom, nearly 93% of teachers can achieve clear thinking and outstanding difficulties. Due to individual differences of students, some students have a poor foundation. In the information-based classroom, 59.1% of teachers cannot teach students at different levels.

The information-based classroom increases the amount of teaching lesson preparation for teachers. Taking mathematical operation and mathematical analysis as an example, mathematical operation and data analysis run through the whole process of mathematical learning and are the most fundamental part. Clear understanding of logarithmic can train the students' mathematical thinking, teachers in information technology class can use Excel can simulate relevant mathematics experiment, with the help of the software, students can from complex, a large number of computation and verification, software after the accurate results, focuses on the analysis results, explore the law to solve practical problems. When analyzing the data, relevant software can be used to observe the dynamic chart of the development of the value and understand the trend of the quantity change, so as to help students summarize the rules and draw conclusions. As a teacher, he should learn how to operate the software in advance and apply it in the classroom. For example, sievert series of teaching software has become quite common. In high school mathematics class, students can use sievert to play presentations, mark, modify, draw and so on the big screen. The operation is very simple. When analyzing the data, students can input the data they can speak into seewo, and seewo can make statistical tables and charts according to the needs, so as to study the changes of the data in a more intuitive and convenient way, and draw conclusions through the analysis of the trend of the data.

2. *The Comparison between Information-based Classroom and Traditional Teaching Classroom from the Perspective of Students*

The questionnaire mainly reflects the current situation of high school mathematics class through three aspects:

students' acceptance of knowledge points; How much they like the classroom model; Attitude towards the teaching style of teachers; The degree of participation in mathematical cooperative inquiry. Analysis of the following.

Table 5. How much students like the information-based classroom model (%).

Title\Option	Very consistent	Consistent	Tolerable	Inconsistent	Very inconsistent
Ability to keep up with learning and focus	67.1	26.8	3.4	1.7	1.0
Can actively participate in the classroom under the guidance of teachers	68.5	15.3	7.5	6.0	2.7
Want to express their ideas, speak up	42.4	37.9	16.3	3.4	0.0
In such a classroom style, I prefer to learn mathematics	43.7	41.0	5.8	8.5	1.0
Be able to understand and learn mathematics knowledge more solidly	34.2	38.3	19.7	6.1	1.7

Table 6. Students' preference for traditional classroom model (%).

Title\Option	Very consistent	Consistent	Tolerable	Inconsistent	Very inconsistent
Ability to keep up with learning and focus	40.3	33.2	22.7	2.7	0.1
Can actively participate in the classroom under the guidance of teachers	32.2	42.4	16.9	8.5	0.0
Want to express their ideas, speak up	28.8	21.6	42.4	6.8	2.4
In such a classroom style, I prefer to learn mathematics	30.2	30.8	22.7	14.2	2.1
Be able to understand and learn mathematics knowledge more solidly	35.6	33.6	19.7	10.8	0.3

As can be seen from table 5 and table 6, students' learning happiness in information-based class is higher than that in traditional class. 73.5% of students can follow the teacher's ideas in class and concentrate on learning knowledge in class. 83.1 percent of students are willing to speak up and express their ideas in class, while only 40.4 percent of students in traditional classes are willing to express their ideas. 84.7 percent of the students said they preferred to study mathematics in the information-based class, while 49 percent said they did not learn well in the traditional class.

The core quality of mathematics is the center of teachers' teaching activities and the basic skills students should learn when learning mathematics. Due to the nature of mathematics, in traditional education and teaching, students are generally less interested in mathematics, more passive in learning, less flexible in knowledge acceptance, and unable to achieve the effect of applying what they have learned into practice. Therefore, it is difficult for students

to achieve the dominant position in mathematics learning. Face subjects of study in high school and the double pressure of college entrance examination, to the attention of the academic record is far more than to the attention of the skills to master degree, under the expectations of the parents and teachers, the students also lack the search for knowledge, spirit, but simply to accept knowledge, mathematics is an interesting and logical discipline, students rely on rote memorization alone is no way to learn mathematics, more can't understand the fun of learning mathematics, which has violated the law of mathematics teaching, more is the core of mathematics quality, students' classroom learning quality cannot be guaranteed.

Taking mathematical modeling as an example, mathematical modeling is a conventional idea to solve mathematical problems. To find rules and verify rules in problems, and to find the best way to solve practical problems through correction, not only cultivates students' innovative consciousness, but also applies this method to the study of other subjects. Under the support of information technology, the mathematical model of classroom is more convenient and flexible, teachers and students are involved in the classroom, explore the mathematical laws together, reversed before just by the classroom teacher instilled knowledge, students' active learning is the key to teaching, in the face of learning not a dull, lack of initiative is a common phenomenon, into the modern technology class for high school students is novel, especially when learning new knowledge, new knowledge to the new environment can stimulate students' interest, into the classroom, improve the efficiency of learning knowledge.

Information technology into the classroom, but also to cultivate the students' spirit of cooperation, to explore the mysteries of mathematical modeling, need more wisdom, students found in the discussion, the cooperation rule, shortens the distance between teachers and students, students and students, cooperative inquiry learning in the classroom, in the mastery of knowledge and improve the learning ability. High school students form mathematical modeling awareness and thinking in mathematical modeling in learning. Under the guidance of teachers, students become the subject of operation, and use information technology as the main bearing way of mathematical modeling to make the process more efficient, save time and improve the learning efficiency of students. In addition, for students in the new era, adopting a way that conforms to the characteristics of the Times, students can be more exposed to new things, which is also conducive to better integration into the society in the future. The integration of information technology into the classroom not only enables teachers to enjoy the convenience brought by information technology, but also allows students to experience the classroom full of modern technology, participate in the classroom, and feel the joy of learning.

III. Problems in the Integration of Information Technology and High School Mathematics

A. *It is Difficult to Apply Information Technology*

The addition of information technology can make the boring mathematics classroom vivid, but on the one hand, it also affects the teaching effect. In the process of cooperative inquiry learning, some students may not master the mathematics experiment by using the software, which will affect the progress of the experiment and lead to the failure of completing the experiment successfully in one class. In addition, students' acceptance of new things is different, different from traditional teaching mode, independent inquiry learning and the integration of information technology, the students' ability in understanding and hands-on ability are also put forward higher

request, for high school students, some students accept the pursuit of knowledge, only don't want to explore the principle of mathematics, to not adapt to the new teaching mode, teaching effect cannot achieve the desired effect.

The combination of information technology and classroom has higher requirements on the hardware conditions of the school. The school should update teaching facilities and train teachers. The integration of information technology and mathematics teaching is gradual. Organization, on the other hand, teachers training, teachers take a lot of time and energy, with older teachers in school, in the face of more complex software in the information technology, as it is difficult to learn and to use in the classroom applications, often appear all sorts of episode, to a certain extent, affected the class schedule and class effect. Therefore, the use of information technology has certain objective factors affecting the implementation effect.

B. *The Teaching Emphasis is not Prominent*

The application of information technology to adapt to the class, some teachers because the pursuit of the classroom is novel, choosing inappropriate way of teaching knowledge, courseware design more elegant, but not outstanding, the important content of the students in the classroom although experienced a new fun, but did not learn the knowledge of the true, the adornment of the students is not only important to attract, but can't adjust good state of learning knowledge.

Has formed trend information technology into the classroom, create a new class accord with the requirement of contemporary information technology for education teaching plays a role of the auxiliary teaching, teachers should also when preparing the lessons of emphasis on the teaching important points of the lesson, too the fancy decoration teaching important points to cover, loses the significance of classroom teaching.

C. *Students don't have enough Time to Think*

In the use of information technology teaching, students do not have enough time to think. Use of multimedia teaching, the teacher should take into account the students' overall ability to accept, when it comes to teachers in teaching, which is blind to this point, the capacity is larger in the teaching cases, the students' attention is easy to transfer to a large number of new knowledge, students accept ability drops, some teachers in order to explain the class content, compressing the students' time thinking, absorb new knowledge, students can't master and understand the new knowledge in the classroom, the teaching mode has affected the quality of teaching, students can't fully grasp of knowledge.

This kind of phenomenon is widespread in the teaching, for mathematics, students in the class time is indispensable to the digestion of the knowledge, the information technology class can optimize the classroom structure, highlight student's main body status, to a certain extent but should still strengthen the adjustment in terms of student thinking, realize the subject status of the students really.

D. *Misusing Information Technology to Replace Traditional Teaching*

In teaching, teachers use multimedia teaching, and completely negate the original traditional teaching model, information technology is only a helper in teaching, for many problems in teaching, multimedia and other information technology means cannot solve. The application of information technology in teaching does not mean that teachers do not need to explain, but put forward higher requirements for teachers, so teachers should follow the pace of the Times, and constantly improve themselves. Some teachers do not pass the technical application,

in order to pursue the effect but copy mechanically, the classroom to the student's instruction is insufficient, to the lesson content explanation is insufficient, will appear the student's learning effect does not reach the expected phenomenon.

The traditional teaching mode should be improved, and there are many worthy of learning. Education, as a science of continuous development, is not entirely updated in one innovation. Every reform of education is to accept new models on the basis of the original, so as to optimize the educational structure and make the teaching effect more suitable for the development of students. Therefore, in mathematics teaching, can be used to a large number of information technology means, but if the phenomenon of information technology overwhelming, will affect the teaching effect.

IV. CONCLUSION

The integration of information technology into the classroom has promoted the personal growth of teachers. As teachers, they should grasp the direction well, take the advantages of information technology as the sword of mathematics teaching, and remove the obstacles of mathematics teaching. Teachers should improve their own quality, master more teaching skills and integrate information technology and mathematics teaching more thoroughly. As a high school student, already have mature thought, to look forward to the future, if you want to become the master of the future, you should accept the challenge of new things, and information technology is not only a teacher teaching tools, is the key that opens the door to learning skills students, from passive learning to active learning, shift in attitude to learn, to learn math well.

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