Research on the Application of Mind Mapping Concept on Mathematics Education

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Abstract: "Innovative teaching mode, stimulate classroom efficiency, teachers and students grow together" is the slogan of the new curriculum reform on education. The teaching activities under the mind map are interactive activities in which teachers and students participate together. It is a two-way activity of dialogue between teachers and students. It is a process in which teachers and students jointly construct knowledge structure and stimulate thinking and develop thinking ability. In foreign education practice, mind map as a tool to optimize thinking and integrate knowledge, it is very helpful to teachers' "professor" and students' "learning"; in China, mind maps also have a lot in education. Research examples, but only in the high school mathematics teaching application research is relatively small. To this end, this paper attempts to apply the mind map to the "teaching" and "learning" of high school mathematics, and conduct empirical research to provide some reference and reference for future mathematics teaching.

1. Introduction

In today's diverse society, human beings are advancing, and cultural knowledge is accelerating with the progress of social civilization. Human cognition and construction of knowledge are constantly making higher progress. Especially in the understanding of Abstract knowledge, it is advancing rapidly and has reached a higher level. According to the study of cognitive psychology, human understanding of knowledge is an imaging process, which is a complex and changeable process. Psychology believes that the human brain remembers images more strongly than words. In today's advocacy of quality education, classroom teaching emphasizes that students are the masters of learning, and pay more attention to the cultivation and promotion of students' active learning ability and thinking ability. The new curriculum promotes diverse learning methods such as cooperative learning, inquiry learning, and self-active learning, emphasizing that teachers are the leaders, collaborators, and participants of student learning. The teaching process is the interaction between teachers and students to discuss and exchange ideas and solve problems. Process. Therefore, in the teaching process, teachers are more inclined to choose their own teaching methods, pay attention to cultivating students' learning confidence, and give full play to students' subjectivity and creativity. Under the new curriculum concept, the college entrance examination cannot be used as a baton. Therefore, in this kind of learning state, it is better to give students a better learning method than to give them knowledge. The ancients said that it is better to teach them fish. Effective learning methods are the foundation of effective classroom instruction.

2. Relevant theory of mind map

The mind map is proposed under the theory of cranial neuroscience, which expresses human thinking activities through schema methods. Scientific research shows that the realization of human psychological activities is accomplished through the movement of the brain and the entire nervous system of human beings. Neurons (also known as nerve cells) are distinct from other cells in the human body. They are composed of cell bodies and cell protrusions. The initial part of the cell body is thicker and becomes thinner by repeated branches. The shape is like a dendritic shape; Dendrites and axons, which are elongated parts of the cell body that are radial, each neuron can have one or more dendrites that can be stimulated and excited into the cell body. Each neuron has only one axon

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that can transfer excitement from the cell body to another neuron or other tissue. Its function is to receive conditional stimuli, transmit information, and integrate information. The ends of the neuron processes are interconnected and form a very complex network of structures, which constitutes the human nervous system. The information transfer and processing in the human body is handled by it.

Cognitive learning theory is a theory that explores the law of learning by studying human cognitive processes. Humans acquire information and exchange information through perception, attention, understanding, memory, and problem solving. “Cognitive Psychology“ regards the cognitive process as a system consisting of a series of continuous cognitive operation stages, such as obtaining, encoding, storing, extracting and using information, and processing information according to certain procedures. The main feature of cognitive learning theory is to pay attention to the main role of people in learning activities, emphasizing the role of thinking activities such as meaning understanding and independent thinking in learning. Wolfgang. Kohler believes that learning is achieved through the understanding of the relationship of things in the learning context. It is a gestalt organized through purposeful understanding and insight. Jerome Seymour Bruner's Cognitive-Discovery Views: 1 Learning is the process of actively forming cognitive structures. According to a certain structural order, human cognitive activities link newly acquired knowledge with the original cognitive structure to actively construct new knowledge; 2 emphasize the study of the basic structure of the subject. He believes that all knowledge has a hierarchical structure, and the combination of the cognitive structure of the human brain and the basic institutions of the textbook will produce powerful learning benefits. To maximize the benefits of teaching, students are required to understand the structure of things in a meaningful way. The higher the generalization of knowledge, the easier the knowledge is understood and migrated. 3 The cognitive process is formed through active discovery. It is believed that while mastering the basic structure of the subject, students must also master the basic methods of studying the subject, and find that learning can make students more interested and more active in active learning.

3. Analysis of high school mathematics teaching based on mind map

The core concept of the new curriculum reform is to focus on "human development, comprehensive development of students." In the process of education and teaching, the "knowledge and skills, processes and methods, emotional attitudes and values" as the teaching goal, pay attention to the "four basics" teaching, basic knowledge, basic skills, basic ideas and basic activities of the four basic index; Focus on student thinking, student values and the realization of students' self-worth in the learning process. High school mathematics textbooks also respect students' personality development, pay attention to mathematics culture knowledge, and practice activities, focusing on cultivating students' inquiry learning ability and innovation consciousness. In the teaching of teachers, a lot of problem-based teaching content has also been introduced to let teachers and students dance and promote students to actively learn. This is a major feature of modern high school mathematics.

High school mathematics is a dramatic increase in the amount of knowledge relative to junior high school students. It is a lake of mathematical knowledge, a quantitative knowledge of the material world of rich and colorful real life, and a quantitative knowledge that Abstracts specific substances. The connection between knowledge is more closely related, and the logic of mathematical knowledge is more rigorous. The acquisition of this amount of knowledge is mainly obtained and consolidated through the teacher's classroom lectures and after-school exercises.

The mathematical language has also undergone tremendous changes. Compared with the mathematics knowledge of junior high school, Gao Yi mathematics suddenly touches the Abstract set symbol language, logical operation language, function language, graphic language, etc., and the degree of Abstraction is greatly improved. Abstraction is the main reason for the difficulty of mathematics. The higher the degree of Abstraction, the more difficult it is for students to understand. High school mathematics requires more space imagination for students, higher requirements for thinking ability, and more patience and care for computing power.

Under the new curriculum standard, the knowledge points of each part of high school

mathematics are very compact. The setting of knowledge content is progressive and spiraling upwards. The knowledge points between the modules of each chapter are you and me. Your criss-cross, interrelated, through the structure of points, lines, faces, and nets constitute a three-dimensional high school mathematics knowledge system. For example, high school mathematics must be one, the hierarchical logic structure in each chapter is very close, the first chapter learns the collection, the second chapter learns the function, and the function

4. Teaching experiment of mind map in high school mathematics

The effect test is a kind of testing method to check the experimental results. Whether the teaching method has a great influence on the teaching effect of different classes is one of the purposes of our testing. The detection of the effect of learning is an indispensable part of our teaching process. . The author tests the teaching effect of this experiment according to the three aspects of the completion of the work in the middle of the experimental process, the attitude of the study, the test results after the experiment, and the questionnaire before and after the experiment. During a month of mind-based learning and homework completion, students showed positive enthusiasm and self-exploration attitudes. After the content of each lesson, some students draw their own mind maps, organize and improve the knowledge they have learned, and when they have new content and supplementary knowledge points in the process of explaining the exercises, they will be added to the maps in time. In the original picture, compare it with the original picture, think carefully, and do every step of knowledge learning. In the process of learning, students not only use the mind map to learn, but also use the mind map to carry out a knowledge of self-awareness. When students learn parallel relations, after learning the nature theorem of parallel relations, then the judgment theorem is the inverse process of the property theorem. Students can use the mind map to draw the two-line arrows of the decision theorem and the property theorem, so that they can be better. Understanding the connection between knowledge. In the process of solving the problem, first read the question, read the mind map drawn from the brain, and analyze the meaning of the question. Finally, use the property theorem of the parallel relationship and the process of reciprocity of the decision theorem and the relationship between the knowledge points. problem. According to the nature theorem of the parallel relationship, the student is the mind map drawn by the inverse process of the judgment theorem. In the process of solving problems, use the connection between knowledge points, consider each knowledge point involved in this question, and quickly answer the questions. The enthusiasm and active exploration attitude of using mind mapping to improve students' interest in mathematics learning and the initiative of independent learning.

The examination is an important method to check the learning situation and the teaching effect. It is the teacher's analysis of the students' understanding of the knowledge and the judgment of the situation. Through the examination, the teacher judges the students' knowledge of the situation, the development of learning ability and thinking ability. The author examines the influence of teaching methods on the knowledge of students in different classes. The teaching under the mind map is only for the chapter of the first chapter of the Beijing Normal University. The first chapter of the "Preliminary Geometry" chapter is taught. Therefore, when the test paper is compiled, the content is limited to the contents of this chapter of "Preliminary Geometry". Under the new curriculum standards and teaching objectives, the content of the test papers is basically carried out from four aspects: mastery of knowledge points, memory ability, logical thinking ability and computing ability. The test and test classes were tested at the same time. The scores of the test papers are pipelined and scored.

After the test, the researcher conducted a questionnaire survey on the mind map of the experimental class to better understand the learning effect and evaluation of the students under the teaching mode. The content of the questionnaire includes the degree of students' preference for teaching teachers to use mind maps in the classroom; whether teachers use mind maps to teach in class can help students learn; whether students can draw their own mind maps by learning Help; whether the mind map can help students improve their self-perception of learning efficiency and other aspects. After the survey, the effect of the mind map in the classroom teaching was tested

according to the percentage of the number of people selected in the questionnaire statistics.

5. Conclusion

As a basic tool for expressing radiological thinking, mind map is relatively simple. Applying it to the high school mathematics teaching process can not only better develop students' creative thinking, but also enhance the effectiveness of students' knowledge learning. Therefore, teachers should start from the actual situation of students, create a mind-guided mathematics teaching situation, apply it to each teaching link, establish the learning confidence of students' mathematics, help students to build a perfect mathematical knowledge network system, and be able to solve mathematical problems. Grasp the knowledge points in time, connect with mathematical formulas, laws and problem solving methods to improve the effectiveness of mathematics knowledge.

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