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Research on the Application of Mind Map in Multimedia Network Teaching Environment

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Abstract—With the rapid development of Internet technology, multimedia network teaching has become a new teaching mode in the teaching work of major universities. In the context of multimedia technology, the use of mind maps to carry out teaching activities in various disciplines can give full play to the advantages of both, which can use mind maps to present the knowledge learned in an intuitive and vivid way. This not only helps students sort out their knowledge, but also enables students to master important and difficult knowledge faster and more efficiently, and enhance their memory and thinking skills. This is also conducive to the cultivation of students' divergent systems, systematic thinking and creative logical thinking. Based on this, this article will discuss and study the application of mind mapping in college multimedia network teaching environment. The author hopes that the combination of multimedia technology and mind mapping can maximize the effectiveness of teaching.

1. INTRODUCTION

A mind map is a thinking tool that can combine text, color, graphic images, lines, and symbols for visual representation. This can not only sort out the logical framework, but also help diversify people's thinking, cultivate people's innovative thinking, make users' thinking more active, and improve their ability to analyze and solve problems. At the same time, the effective use of mind maps can also enhance the user's memory, improve learning and work efficiency, and solve problems creatively and efficiently. For one thing, applying mind maps to teaching work can help teachers sort out the most difficult points in teaching. Teachers can better plan their teaching with the help of mind maps, and arrange the content of class time reasonably. Meanwhile, this also reduces the workload of teachers. For another, students can think about problems from many aspects and carry out divergent and creative thinking. Students can use mind maps to connect various knowledge points together. The use of mind maps to present the progressive and sequential relationships between knowledge points and a comprehensive visual representation of knowledge will also help improve students' thinking divergence and their ability to discover and solve problems. The use of multimedia software to make mind maps and use multimedia tools to show the operation process of teaching work is very simple. We can make use of multimedia technology's high degree of visualization, intuitive image, and playback, preservation and review features to make teaching work more colorful. This will help improve teaching efficiency and quality.

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2. MIND MAP OVERVIEW

2.1.Meaning

Mind maps are also called mind maps. It was first proposed by psychologist Tony Bozan as a thinking tool for information storage, organization, optimization, and output presentation in graphical form and network structure. Simply put, it is to simulate the processing method of the human brain, and connect the result of the human brain on the central graphic with a straight line and the central graphic, and so on to form a tree-like mind map.

2.2.Features

First, radioactivity. The structure of mind maps is similar to that of human brain neurons. When using mind maps to carry out college teaching, as long as you determine the themes and keywords, you can expand and diverge outward, forming a progressive and closely connected network structure diagram. Second, intuitive and vivid. The use of mind maps in college teaching can present abstract and incomprehensible knowledge points in an intuitive way, and then teaching can make students understand better and remember more deeply. Mind maps can combine text, graphics, colors, symbols, lines, etc., which will make the presentation of information more intuitive and vivid. Especially for the efficient use of color, it stimulates the human brain a lot. This is different from general plane information. It can greatly stimulate the human senses, making people impressed and interested in learning and exploring. Third, the three-dimensional relevance of diversity and knowledge system. The development of the mind map is very fast. Not only can different knowledge be radiated through lines, pictures, colors, numbers, etc., but also the development process of the mind map can also be presented. In the meantime, when using the mind map to analyze and deal with problems, the three-dimensional and relevance characteristics can be used to expand associations from different angles, showing a three-dimensional context structure. In addition, mind maps are highly compressible. That is, through screening and optimization, valuable and logical information is presented, and it is connected with other information to fully and clearly express the central meaning.

3. THE ADVANTAGES OF MIND MAPPING IN TEACHING

3.1. Conducive to Give Play to Students' Abstract Thinking Ability and Form A Clear Knowledge Network Structure

When using mind maps to carry out college teaching, teachers can effectively cultivate students' abstract thinking and divergent thinking ability by using the divergent characteristics of mind maps. College students have a lot of theoretical knowledge, but they generally lack abstract thinking ability and the ability to integrate and organize various knowledge. The use of multimedia to present the mind map can not only realize the integration of knowledge, but also make the knowledge structure clearer, which is convenient for students to learn.

3.2.Use Multimedia Display to Enhance Students' Memory and Understanding

The mind map can be expanded and extended as long as the themes and keywords are determined, and the use of multimedia technology can show this expansion process. In this way, students can feel the dynamic changes of thinking in a dynamic, visual and intuitive form, activate their thinking, and improve the effectiveness of the application of mind maps. Teachers can make use of the open, intuitive, and dynamic characteristics of multimedia to make students gradually form abstract thinking and have a better understanding of knowledge. This also enhances the memory of students, so that the quality and efficiency of learning are improved.

3.3.Cultivate Students' Creative Thinking Ability

The professional construction of universities is constantly developing. The professional construction of disciplines is not only theoretical, but also requires innovative practice. Therefore, in the teaching

process, teachers must strengthen the cultivation of students' innovative thinking ability, activate students' thinking, and enable them to actively participate in the exploration and practice of subject activities. In actual teaching, the use of mind maps can enable students to have a firm grasp of the basic knowledge framework. Moreover, in the process of using mind maps, students' innovative thinking and logical thinking will be enhanced.

3.4.Strengthen the Thinking Guidance to Students and Improve the Quality of Teaching

With the continuous deepening of teaching reform, the teaching work of colleges and universities must give full play to the subjective status of students and encourage students to explore and practice independently. In this process, making good use of mind maps and giving full play to their characteristics of connecting and flexibly displaying relevant knowledge can enable students to be more involved in learning and inquiry. Teachers can use mind maps to guide students' thinking, thereby improving the overall quality of teaching.

3.5.Effect on Teachers

For teachers, mind maps are helpful to help teachers make scientific and reasonable teaching plans. Teachers can use mind maps to impart teaching material knowledge to students faster and more effectively. This is conducive to the improvement of teaching quality and efficiency. Using multimedia to display mind maps instead of traditional blackboard teaching in different lesson types can turn long lists of boring information into colorful, easy-to-remember, highly organized pictures. In this way, teachers can show it through multimedia while speaking. This not only reduces the workload of teachers, improves the efficiency and quality of lesson preparation, but also facilitates students' reference, review and memory. In addition, mind maps can help teachers integrate the knowledge they want to teach faster and more comprehensively. Then, teachers can create teaching situations according to students' knowledge structure and cognitive ability, which is conducive to breakthroughs in teaching important and difficult points. Teachers can use mind map colors, curve changes, graphic beauty and fonts to stimulate students' senses. Simultaneously, this also stimulates teachers' enthusiasm for teaching, which is convenient for teachers to implement teaching work.

4. THE SPECIFIC APPLICATION OF MIND MAP IN MULTIMEDIA TEACHING

4.1.Application in the Teaching Process

Firstly, in teaching, teachers use the multimedia display of mind maps to facilitate their own hand-drawing or use software to make mind maps. This can make the students' notes not only clean and complete, logically clear, but also because the combination of text, pictures, colors, numbers, etc., makes the information presentation more complete and the memory effect is better under the stimulation of multiple information. Secondly, students can make a mind map of the knowledge learned in class. This process is actually a process that promotes students' divergent thinking and focused thinking. Students can make reasonable innovations on the basis of respecting objective laws, which is conducive to the improvement of students' thinking quality.

4.2.Application in Consolidation Review

Using mind maps to construct a knowledge framework in the later process of consolidating review and welcoming exams can not only connect the content knowledge of a course, but also link the knowledge of the entire course to form a logical and clear mind map. Students can then process and analyze according to their own learning habits, and finally form a clear and vivid comprehensive thinking map. In the review process, these mind maps are convenient for students to review and consolidate many times, so that they can remember more clearly and grasp the important and difficult points more firmly. Teachers can make use of the orderly, classy, and visual characteristics of mind maps to improve the efficiency of students' review. At the same time, this can also help students get rid of the problematic

tactics. After students use mind maps to organize and consolidate their knowledge, they will improve their understanding of core knowledge.

4.3.Application in Thinking Training

Before carrying out systemic thinking training in colleges and universities, teachers must first guide students to understand and master the theoretical knowledge and practical skills of mind mapping. Students need to form a basic understanding of the meaning, characteristics and functions of systematic thinking training. When training students' thinking skills, students may encounter many problems such as incomprehension or easy forgetting, which will reduce their interest in learning in the long run. Only by making good use of the mind map can the students' learning motivation be stimulated, and the effect of learning and memory can be guaranteed, so that the students can enter a good learning state. Therefore, teachers must guide students to carry out preschool preparation work. Teachers mainly need to sort out the entire knowledge framework and use mind mapping to highlight the core and important issues. In this technology, students can organize the knowledge they have learned and then use computer software to draw specific mind maps and share them on the learning platform. Teachers can comment on the completion of students and organize student exchanges and explorations. Teachers should highlight the main problems and improve the mind map. Teachers can use the mind map to repeat the knowledge points after the review after class. So as to ensure the effect of review, and further strengthen students' willingness to learn.

4.4.Applications in other Areas

Mind maps can also be used in the process of making personal learning plans, writing reports, writing papers, and giving speeches. Students can use mind maps to extract valuable information more quickly and accurately, thereby improving learning and work efficiency. Besides, in the process of group cooperation, communication training, and independent exploration, the use of mind maps can improve the efficiency and effectiveness of group cooperation and training, and make the preliminary design more effective.

5. APPLICATION OF MIND MAP IN FLIPPED CLASSROOM TEACHING CASES

5.1.Teaching Sample

Taking flipped classrooms in colleges and universities as an example, mind mapping can be used for the entire process from teaching design, teaching activities to summary feedback. Teachers can design a visual flipped classroom learning model with practical guiding significance, including pre-class inquiry, in-class internalization and after-class practice. The visualization tools are mainly mind maps. Whether it is students' data preparation, pre-class preview, group discussion in class, and review and summary after class, they all use mind maps to carry out independent exploration and learning.

First of all, in the pre-class preview, teachers can use mind maps to develop a learning list and draw a learning navigation system. At the same time, this is also helping students clarify the content, goals and methods of autonomous learning, and present them in the form of mind maps. Secondly, students can use the mind map, a new type of note-taking tool, to accurately and quickly record the important and difficult knowledge of the teacher in the classroom, and follow the teacher to make an efficient summary and record. Thirdly, students can conduct group brainstorming in a multimedia context and draw a mind map of the discussion. This not only helps to find problems more clearly, triggers more student exchanges and consultations, and improves student group learning ability, but also improves the efficiency of problem solving. Otherwise, in innovative learning, the use of mind maps to carry out creative work can give full play to students' creative thinking, which in turn mobilizes students' active learning. Teachers can provide students with a free creative environment and guide students to think rationally. This will not only help students clarify the context of ideas and knowledge, but also allow students to connect knowledge in their minds through the framework of thinking. Students can integrate these existing knowledge and experience when necessary in other innovative activities such as

independent exploration. Afterwards, students can make reasonable speculation and thinking to make their thinking more flexible and make their learning more creative.

5.2.Application Effect

From the survey on the application of the flipped classroom mind map for a certain course of the school, it is found that the use of mind maps to carry out independent learning has significant effects, and the teaching quality and efficiency have also been improved. Among the 100 students we surveyed, 70% of students think that mind maps help them diverge their thinking, 50% of students think that mind maps have exercised their systematic thinking, and 40% of students think that it improves Their logical thinking. More than 95% of students think that mind mapping is helpful for them to deepen their memory of the course, and the change of memory mode allows them to better summarize and understand the knowledge structure. In the classroom group discussion study, most students think that the use of mind maps makes them more interested in participating in group discussions. Students can use mind maps to show the results of their group cooperation and also stimulate their interest and motivation in learning. More than 90% of students think that using mind maps to take notes saves time and effort, and the notes are clearer and purposeful, which greatly improves their learning efficiency. In addition, the mind map is visually intuitive and has both pictures and texts. For the majority of students, after using the mind map for learning, they often discuss the production of the mind map. Such learning is more interesting than traditional learning. This not only fully mobilizes the five senses, but also enables students to understand and remember the learning content independently.

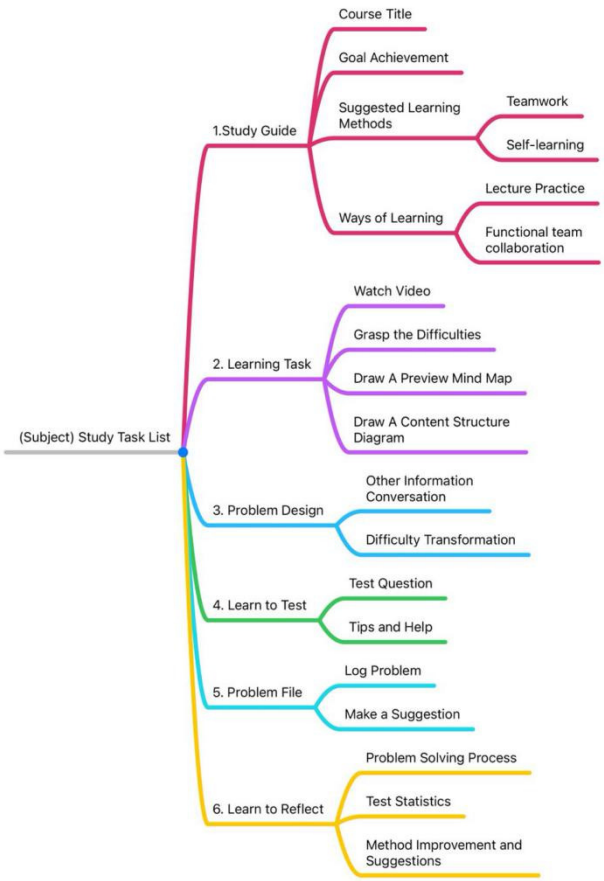


Figure 1. Mind Map of A Course "Learning Task List"

6. MIND MAP PRODUCTION SOFTWARE, REQUIREMENTS AND USE

6.1.Common Mind Map Production Software

Commonly used production software includes Edraw icon, Mind Manager, i Mind Map, X Mind, Mind Mapper, Free Mind, Nova Mind, etc. Each of these software has its own characteristics and advantages. Some user interfaces are more friendly and feature-rich, while others are more flexible. They can be integrated with other software to facilitate information management and presentation. Take the commonly used Mind Mapper as an example. It can not only produce professional visual mind maps, but also facilitate information storage, management and processing. It is highly intelligent and can be combined with PPT to demonstrate the mind map.

6.2.Mind Map Production Requirements

When making a mind map, we need to first determine the subject such as article name, book title, etc. Then, show it graphically. The center image should have at least three colors, a theme corresponds to a large branch, and each branch is expressed in a different color. We can write keywords above the lines. The lines should be the same length as the words, the central line should be thicker, and the lines should be connected to each other. We need to use numbers to mark the order, and then rationally layout to form our own style.

7. THE USE OF MIND MAPS

The mind map can be combined with innovative teaching methods such as cooperative teaching, inquiry teaching, task-based teaching and so on. It is best for teachers not to ask students to use drawing software to make mind maps at the beginning of teaching. Teachers can let students follow the teacher's hand-drawn mind maps, which is easy to accept and easy to take notes later. The focus of this stage is to cultivate students' divergent thinking to make them aware of the importance of mind mapping for improving their learning efficiency. Teachers can show excellent mind maps to students in teaching, and provide rich case resources, and then arrange themes for students to learn to draw mind maps by themselves. After students have basically mastered the use of mind maps, teachers began to teach students to use simple mind map production software to draw mind maps. This allows students to grasp the key points of knowledge and display them in multiple dimensions, and allows students to use mind maps to summarize their knowledge. Teachers should emphasize the use of mind maps to help students build connections between various knowledge points, enhance the macro and comprehensiveness of students' thinking, and enable them to better grasp the logical relationship between knowledge points and better Master the knowledge points. Regarding the application of mind maps in teaching, first of all, we must understand that mind maps are not just a software, a tool or a framework, but a macroscopic way of thinking that connects knowledge together. For students, learning to make and use mind maps is conducive to diverging their thinking. Moreover, this process can also cultivate students' own innovative ability and independent inquiry ability. Students will grasp the knowledge points firmly through divergent thinking and repeated memory, and improve their ability to discover and solve problems. Secondly, combining the mind map with information technology and disciplines can make the modification, addition and deletion of the mind map more convenient. We can also display and share the drawn mind maps on the platform. In this way, the communication between disciplines can be enhanced while improving the information technology capabilities.

8. CONCLUSION

In summary, mind map is a kind of auxiliary teaching tool similar to multimedia projectors, slides and so on. But its biggest feature is that the mind map can integrate scattered knowledge and present important and difficult knowledge, and in its rich form, it encourages students to think divergently. This facilitates students to form a knowledge framework, enhance memory and consolidation, thereby improving the quality and efficiency of learning. Colleges and universities will combine mind mapping and multimedia technology in the teaching of various subjects. This not only helps teachers to better

sort out the teaching content and make the teaching plan more scientific and reasonable, but also gives play to the role of mind mapping and the function of multimedia, so that students can form abstract thinking and make their understanding of knowledge more in place.

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