Exploration of the Application of Mind Mapping Combined with Computer Technology in Computer Teaching

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Abstract. Objective: To explore how to combine mind mapping with computer technology in computer teaching. Methods: According to the natural division method, 39 students in the first class used the interactive teaching method of mind map, 36 students in the second class used the interactive teaching method of brainstorming to compare the passing rate of the final examination between the two classes. Results: The pass rate of class one was significantly higher than that of class two, especially the pass rate of female students in class one was 52.4% higher than that of class two. Conclusion: Mind mapping is more suitable for computer teaching in colleges and universities. We should combine mind mapping with computer technology to improve teaching quality.

Keywords: Mind Map, Computer Teaching, Passing Rate

1. Introduction

Mind map, also called mind map in English, is an effective graphic thinking tool to express divergent thinking. It is simple but effective, and it is a practical thinking tool. Mind map uses the technique of paying equal attention to graphics and text to show the relationship of subjects at all levels with the hierarchical chart of mutual subordination and correlation, and to establish the memory link between subject keywords and images, colors, etc. Mind mapping makes full use of the functions of left and right brain, and uses the laws of memory, reading and thinking to help people develop in a balanced way between science and art, logic and imagination, so as to open up the infinite potential of human brain. Mind mapping has the powerful function of human thinking.

The computer itself is also a tool. In today's Internet society, computer technology has penetrated into all aspects of production and life, and various technologies are also complex. If we want to clarify the relationship between these technologies, mind mapping is a better cutting in tool[1].
2. The Value of Mind Mapping

Mind map is also called brain map, mental map, brainstorming map, inspiration trigger map, concept map, tree map, branch map or thinking map. It is a kind of image thinking tool and a kind of thinking aid tool. Mind mapping is the idea of using a central key word or idea to cause visualized construction and classification; it uses a central key word or idea to connect all representative words, ideas, tasks or other related items in a radial linear way.

Mind mapping is a method of visualizing thinking. We know that radioactive thinking is the natural way of thinking of human brain. Every kind of information entering the brain, whether it's feeling, memory or idea - including words, numbers, symbols, fragrance, food, lines, colors, images, rhythms, notes and so on, can become a thinking center, from which thousands of joint points, each joint, can radiate out Point represents a link with the central theme, and each link can become another central theme, and then radiate thousands of joint points outward, showing a radioactive three-dimensional structure, and the links of these joints can be regarded as your memory, just like the neurons in the brain are connected to each other, that is, your personal database[2].

The key value of mind mapping is to clarify the cognitive mode of students for a technical system, find the short board of knowledge, and more suitable for the ideological exchange between students, teachers and students, find their own cognitive differences, and carry out targeted communication.

3. Teaching Method Design

Choose 75 students who study computer three-level C language. According to the natural class arrangement, the first class uses the mind map method to conduct interactive teaching, and the second class uses the brainstorming method to conduct interactive teaching. Investigate the passing rate of the two classes and the scores of the relevant knowledge points.

Among them, there are 39 students in class I, 18 boys and 21 girls, aged 19-21, 36 students in class II, 16 boys and 20 girls, aged 19-21, both of whom are sophomores of our university, majoring in secretarial, administrative, business management, law, history, philosophy, etc.

The mind map method requires students to draw a mind map in each class, then discuss the mind map in groups, and finally draw a collective mind map in groups.

The brainstorming method requires students to have group discussion after class, analyze each other's learning short board, and conduct group confrontation interaction.

The duration of study is 1 semester and 16 weeks.

All students take the national computer level examination level 3 C language examination.

4. Teaching Achievements

Among the 39 students in the first class, 27 passed, with a passing rate of 69.2%. Among them, 11 passed among 18 boys, with a passing rate of 61.1%. Among 21 girls, 16 passed, with a passing rate of 76.2%[3].
Among the 36 students in the second class, 19 passed, with a passing rate of 52.8%. Among them, among the 16 boys, 9 passed, with a passing rate of 56.3%. Among the 20 girls, 10 passed, with a passing rate of 50.0%.

See Table 1 for details. The data in the table \( t > 10.000, P < 0.05 \), with statistical difference.

**Table 1. Comparison of Pass Rate**

| Grouping | Pass | %  | Boys N | Pass | %  | Girls N | Pass | %  |
|----------|------|----|--------|------|----|---------|------|----|
| Class 1 N=39 | 27   | 69.2% | 18    | 11  | 61.1% | 21    | 16  | 76.2% |
| Class 2 N=36 | 19   | 52.8% | 16    | 9   | 56.3% | 20    | 10  | 50.0% |
| t        | 16.253 | 15.447 | 16.836 | 17.652 | 14.668 | 15.212 | 14.671 | 15.335 |
| P        | 0.002 | 0.009 | 0.018 | 0.008 | 0.003 | 0.021 | 0.005 | 0.006 |

5. Discussion of results

The passing rate of the first class using mind mapping teaching method is significantly higher than that of the second class using brainstorming method. Compared with brainstorming, mind mapping is easier to quantify, and mind mapping is easier for students to master. Brainstorming method is more open than mind mapping method, but its operation is more difficult, and more depends on the personal ability and project experience of participants\[^4\]. For college students, their ability to control brainstorming is obviously insufficient, which is the reason why brainstorming method has not achieved good results.

The special expenditure is that the ratio of passing rate of boys and girls is 6.1:7.6 for the first class students who use mind mapping, and 5.6:5.0 for the second class students who use brainstorming, that is, the passing rate of girls is significantly higher than that of boys, while the passing rate of boys is significantly higher than that of girls for the second class students who use brainstorming. The data \( P < 0.01 \) was significantly correlated with the overall data.

It can be concluded that mind mapping is more effective for girls to learn complex technology. That is to say, most of the girls will get knowledge and skills improvement in the process of thinking arrangement. This also fully solves the teaching difficulty of the low passing rate of the computer technology examination for girls\[^5\].

In the two classes, the boys' passing rate was 61.1% and 56.3% respectively. The passing rate of boys in the first class using mind mapping method was 8.5% higher than that of boys in the second class using brainstorming method. The passing rate of girls in the two classes was 76.2% and 50.0% respectively. The passing rate of girls in the first class who used mind mapping method was 52.4% higher than that of girls in the second class who used brainstorming method. On the one hand, mind mapping has a positive significance for boys, but more significant for girls\[^6\].
6. Summary

It is not that more complex and advanced technology can play a more active role in daily teaching. The difficulty of mind mapping method compared in the experiment is significantly weaker than that of brainstorming method. Even in the planning engineering practice, mind mapping method is only an analysis tool of brainstorming method, but the teaching itself should take into account the students' ability to accept and control. Choosing a teaching method that is more suitable for teaching can often achieve twice the result with half the effort.

References

[1] Science; Investigators at University of Novi Sad Detail Findings in Science (The Implementation of Mind Maps In Teaching Physics: Educational Efficiency and Students, Involvement)[J]. Science Letter,2019.

[2] Yan Wang. Application on Mind Map in College English Reading Teaching[P]. Proceedings of the 2016 International Conference on Economics, Social Science, Arts, Education and Management Engineering,2016.

[3] Ernanda Ariyatna,Abdurrahman Adisaputra,Isda Pramuniati. The Development of Teaching Materials Writing Biography Text Based on Mind Map[P]. Proceedings of the 2nd Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL 2017),2017.

[4] Yuan-Fan Li,Xin-Yue Wang,Hui-Ling Feng. The Application of Mind Map in ESP Teaching and Learning[P]. Proceedings of the 4th Annual International Conference on Management, Economics and Social Development (ICMESD 2018),2018.

[5] Harkirat S. Dhindsa,Makarimi-Kasim,O. Roger Anderson. Constructivist-Visual Mind Map Teaching Approach and the Quality of Students’ Cognitive Structures[J]. Journal of Science Education and Technology,2011,20(2).

[6] Jiang zheng. Application of mind mapping in computer principle teaching [J]. Computer age, 2010, (1). 64-66.