

The Application Research in Cultivating Pupils' Collaborative Learning with Visual Thinking Tools: A Case Study of *Exploring the Similarities and Differences between Frogs and Toads* in Comprehensive Practice Course

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Abstract: The perspective on new learning ability in the 21st century had emphasized the importance of collaborative learning. This study introduced how to use visual thinking tools to cultivate pupils' collaborative learning ability in comprehension practice course. Also, we reflected the effects and shortages of collaborative learning activities by using visual thinking tools. We found that: (1) most pupils think visual thinking tools are beneficial to collaborative learning. (2) Visual thinking tools have great advantages in knowledge management, group discussion, etc. (3) Division and cooperation in group members is not ideal. (4) Group members lack of collaborative reflection after collaborative learning.

Keyword: *visual thinking tool, collaborative learning, collaborative learning activities*

INTRODUCTION

The United Nations Educational, Scientific and Cultural Organization had put forward the four pillars of learning in 21st century clearly. They were learning to know, learning to live together, learning to be and learning to do. Professor Kubota also pointed out that the new learning ability in 21st century requires students to possess higher order thinking ability, social relations ability and intentions. Social relation ability means social communication ability. We can see that collaborative learning is important for our pupils. However, pupils generally show a lack of communication and collaboration skills for lacking of creating collaborative learning opportunities for students in the current primary school education.

We probed the visual thinking tools, we found its biggest characteristic is divergent and it is helpful for constructing a kind of discussion and negotiation atmosphere. In addition, its powerful graphics technology and its non-linear recording mode would stir up students' thinking sparks and create valuable ideas. This will be helpful for knowledge construction, discussing and solving problems. According to this, we tried to use visual thinking tools in comprehensive practice course. The aim of this study is to create a collaborative learning environment for pupils using visual thinking tools, to promote their collaborative learning ability.

RESEARCH QUESTIONS

We believe that using visual thinking tool could promote students' collaborative learning ability. The purpose of this study was to explore 1) whether visual thinking tools used in comprehensive practice course can promote pupils' collaborative learning ability, 2) what shortages are there in collaborative learning activities by using visual thinking tools.

METHODOLOGY

In the comprehensive practice course named *Exploring the Similarities and Differences between Frogs and Toads*. Students can use visual thinking tools to collect and organize information, to draw visualization mind maps, to complete mind maps and PMI tables, etc. in collaborative learning.

1. Collect and Organize Information

According to the shape characteristics, living environment, living habits and functions between frog and toad, students were divided into four groups for each group of 8 students. Students should get information which could be pictures, videos, texts and so on through the way of the field research, the Internet, books, etc. Then, students organized the collected data, discussed in group to summarize the point of view, and make them into PPT, radio messages reception by hand, proposals, etc.

2. Draw Visualization Mind Maps

Students began to discuss and choose thinking tools to render the theme information after organized the information they collected. During this process, students can develop their imagination and creation to share their views about how to draw Venn diagram and Connection diagram. This kind of collaborative learning deepened students' understanding of visual thinking tools and cultivated their collaborative learning ability and thinking ability.

3. Complete Mind Maps

Students began to summarize the organized information and complete the Venn diagram and Connection diagram together with group members. During this process, 4 group members should complete Venn diagram while 4 others should complete Connection diagram. Members who responsible for completing Venn diagram will discuss the similarities and differences between frogs and toads, while members responsible for completing Connection diagram will discuss the shape characteristics, living environment, living habits and functions between frog and toad. During this process, students should record group members' view in notes and posted them into Venn diagram and Connection diagram.



Figure 1. Students complete mind maps

4. Complete PMI Tables

During this process, 3 group members responsible for completing P in the PMI table, 3 members for M and other 2 members for I. Then, group members will discuss their satisfactions about this lesson and plus, minus and interesting of their own group and other groups. During discussion, students responsible for the corresponding content should record group members' view in notes and posted them into PMI table. This kind of collaborative learning can promote students' collaborative learning ability and improve their reflection to further knowledge internalization.

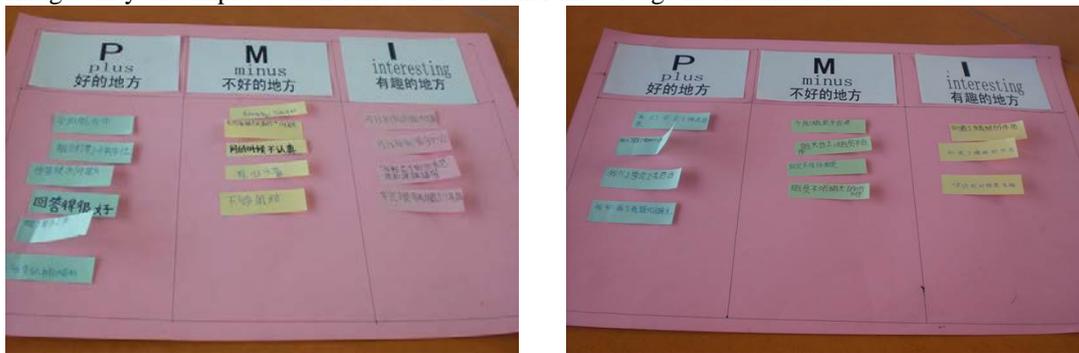


Figure 2. Students complete PMI tables

RESULTS

In this study, we interviewed the students and teachers whom participate in project to investigate their understanding and opinions of visual thinking tools, to survey its applications in collaborative learning. The results are as follows:

1. Most students are willing to use visual thinking tools and they think visual thinking tools are beneficial to collaborative learning. Visual thinking tools can turn boring texts into mind maps which are colorful, easy to memory and organize.
2. Visual thinking tools have great advantages in knowledge management, group discussion, etc.
3. Division and cooperation in group members is not ideal.
4. Group members lack of collaborative reflection after collaborative learning.

Literature Reference

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