The primary school language education of concept maps

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摘要

概念圖是一種組織知識、呈現知識的圖解工具，由概念和其間的關聯所組成。許多研究指出，概念圖是發掘學生先備知識、表徵心智模式及顯示知識結構之有效工具。本研究為探索性研究，嘗試應用電腦概念圖工具 Cmap Tools，提供學生有意義的學習，教師有效的教學，並協助教師組織教學素材及建立教學檔案。教師可利用「專業骨架圖」，提昇教師知識管理的能力，清楚呈現其教學理念與教師專業。本研究預計彙整相關研究，針對概念圖的理論基礎在教學與學習等各項應用論述形成研究命題，最後進行實際概念構圖教學之教學實驗，並將實驗結果彙整分析，以提供教學現場的中小學教師參考與運用。

關鍵詞：概念圖、語文教學、知識結構

Abstract

Concept map is a graphic tool of organizing knowledge, and it is consisted of relationships between concepts and concepts. Many studies have indicated that the concept map is the effective tool to inspire students' prior knowledge, mental representation model and display the knowledge structure. This study is an exploratory research, tries to apply the computer tool of the concept maps, providing the meaningful learning, effective teaching and organizing teaching materials and teaching files. Teachers can use "expert skeleton map" to raise their knowledge management capabilities, and present their teaching philosophy and the teaching profession clearly. This study compiled the relevant research at first, then provided the research propositions base on concept maps theory, and finally perform a practical teaching experiment of concept maps. The results of this research provide references for elementary and junior high school teachers.

Keywords: concept maps, Cmap Tools, knowledge structure

1. Introduction

The concept map is a ocular diagram of the knowledge to complete understand the relationships between concepts and concepts of some knowledge (Anderson, 1992). Since concept maps blossomed, it was seen as effective tools to assist the teachers and students in presenting knowledge structures, and show the diversification of applying (Novak, 1990). Novak also indicated that all of children as blank sheets in the cognitive aspect; in the early phases detecting and learning process, they attain experiences from surroundings, and establish the concept construct. Concept map is an appropriate learning strategy helping children to construct their knowledge.

The researcher wishes to organize the curriculum of the teacher and change the way of teaching through the way of concept mapping. First, the research investigated into the documents, and then experimented on these students who taught by the researcher, using the concept map tool into the language course, specific in teaching construction. Besides, analyze student's willing of learning and the effects.

2. Literature Review

2.1 The foundation of concept map's theory

2.1.1 Meaningful learning

When learners use of specific cognitive operation, a positive interpretation of their experience, it will have meaning, and meaning is the central concept of cognitive experience: When rearrange a series of information, demonstrated the integration of the cognitive

structure, and re-organize, change the overall combination to create the desired results or find the deficiencies of significance to amend and adjust. (Ausubel, Novak & Hanesian, 1978) Meaningful learning refers to learners identified the new knowledge with the old structure consciously. That's meaningful learning (Ausubel, 1968)

2.1.2 Schema theory

Schema, it's means Stored in the memory of data structure presented by the general concept, the schema affect people's interpretation of events and how to solve the problem, they are bred into mental model. Mental model is that when people carry on certain tasks or try to solve some problems, guided by the schema and they controlled their performance results. it has three kinds of the cognitive position(Rumelhart & Norman, 1978)：

1. Increase: add to original schema, the development of the concept just like the process increasing schema.

2. Adjustments: amending original schema, the amendment may be accompanied by a new principle of the concept, like the amendment of the concept, creative output.

3. Reconstruction: developing a new schema by analogy, just as concept maps integrate old knowledge with new to generate learning significance.

2.2 Studies about concept maps

Hsian-Wen Lin(2002)The main purpose of the research was to explore how a teacher applies the concept mapping as a meta-cognitive tool for students to find out the efficient teaching strategy to the second-grade science curriculum in elementary school through the methods of action research with the idea that "Teacher is as a researcher". The results were as follows:

1. Through concept-mapping training, students have more progress in the performance of the "proposition", "cross links" and "examples".

2. Students' major reflections and opinions about learning concept map were: students thought that concept mapping could increase the interests and understand better in science. They also felt the performance of their map would be better by way of cooperative learning.

Bo-Jang Chen (2004) nine sixth-grade elementary students participated in this study. The findings showed that using computerized concept mapping tools in learning was helpful in improving efficiency of students' constructing concept maps and their motivation. Furthermore, using group or cooperative learning strategy to promote the discussion and interaction among students was necessary.

MeChuan Lai(2005) The purpose of this study was to explore the effects of collaborative concept mapping on the science achievement of forth-grade students. Two forth-grade classes were involved in a quasi-experiment using the pretest-posttest nonequivalent group design. According to the results, the conclusions are as the following:

1. Collaborative concept mapping had positive and significant effects on the students' science and technology learning achievement.

2. The strategy of using collaborative concept mapping could facilitate the students' learning retention in Science.

3. Using collaborative concept mapping increased the students' interests in science learning.

4. The students had positive responses to the use of collaborative concept mapping in science learning.

Lichin Whan(2006)The purpose of this study was to investigate the effect of experimental teaching about concept mapping. As concept mapping strategy, the researcher used it to enhance the reading ability of pupils. It summed up appropriate teaching method of concept mapping for our offered suggestions for future researches on the subject. The conclusions drawn from the findings of the study: As for pupils, the concept mapping could prompt the interest, reading ability, and monthly test achievement of the students.

Lin Yen(2006)This study is intended to carry out picture books reading instruction. It utilized concept mapping as the teaching strategy to analyze the effect on elevating second-grade students' writing competence. It is found that picture books combined with concept mapping strategy has accomplished significant outcome in

terms of elevation of second grade students' writing competence. It shows extremely significant effect especially on the elevation of oral expression and writing skill.

Novak and canas(2007) develop the computer concept map tool-C map Tools, matching up the Internet resources to be a new education model, use the concept map to develop teaching plans. Not only strengthen the teaching, but also assess whether it provides meaningful learning, completely keeps tracks of the teaching process. Teachers use professional skeleton map clearly showing their teaching philosophy, as the teacher's super-aided teaching media.

Zang-Yuan Own, Kun-Hung Chuang and Yueh-Hsun Chiang(2007), the purpose of this research was applying the concept map in the chemical E-learning environment. It was not only an experimental approach but also provided a good reference for the related E-learning courses. The results are as followed:

1. The students of concept map E-learning environment outperformed the students of normal E-learning environment.

2. Field Independent students showed better learning achievements in the concept map E-learning environment than Field Dependent students did.

3. Students who spent longer time in the concept map E-learning environment showed better achievements than others.

2.3 Comprehensive Review

Based on the above research, we find that many researchers have significant results. In the early, it was partial towards quantitative research; in the late, the quality of research results and conclusions analog to the situations in the field of teaching. In the form of cooperative learning will affect the learning effect of concept mapping.

3. Research methods

3.1 Research model

Many studies apply the concepts in various subjects and collect relative report. After this, they produced two aspects: one is teaching materials and ways to teaching; another is learning .achievements and willing.(figure 1)

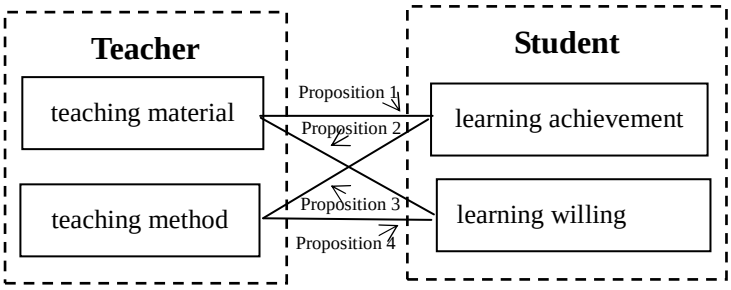

Figure 1: Research model

3.2 Research proposition

Hsian-Wen Lin(2002) who effective to use concept maps to build the model which match today what we have. Other scholars also indicate that students have greatly advanced in applying this material. (Bo-Jang Chen, 2004; Zang-Yuan Own, Kun-Hung Chuang and Yueh-Hsun Chiang, 2007).Regarding above researches, there comes two results as below:

One is the material which composed follow up concept maps can increase student's learning achievement and another is learning willing

MeChuan Lai (2005) point out that cooperative-concept mapping teaching has obvious influence on learning achievement, and can increase student's willing also. Lin Pei Chun (2005) detected that cooperative-concept mapping teaching can increase self-confidence. Other researches also indicate that the concept map's teaching strategy can increase student's learning interest and learning achievement(Lichin Whan, 2006; Lin Yen, 2006) Regarding above researches, there comes two results as below:

One is the way of teaching which follow up concept maps can increase student's learning achievement and another is learning willing.

3.3 Experiment process

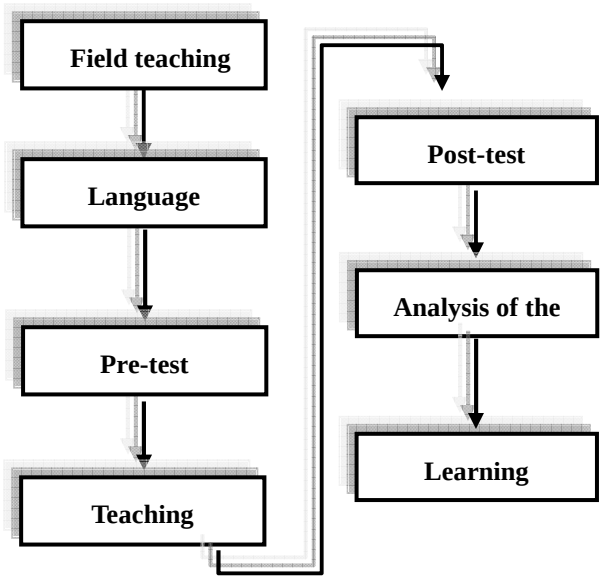

Figure 2: Experiment process

3.4 Experiment design

The research is for Quasi-experimental design. The first grade students in the elementary are the roles. The teacher uses the concept maps to teach, to pre-test to post-test and analyze the results. The researcher interview students and use questionnaires in the end. (The design frame as figure 3)

1. Control variables

(1)The teacher: the researchers themselves.
(2)The Student: who are taught by the researcher.

2. Independent variables

(1)Teaching methods: after the pre-test, use Cmap Tools to learn activities.
(2)Material content: the researcher writing his own concept teaching materials, teaching the syntax.

3. Dependent variables

(1)The score table of sentence composition to grade the learning achievement.
(2)The learning attitude of questionnaires to implement the learning attitude.

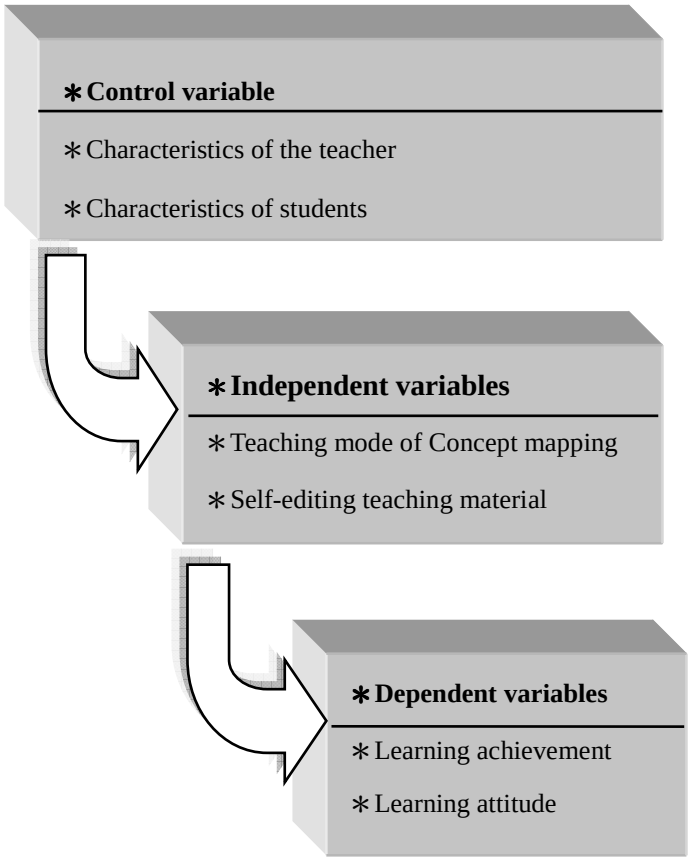

Figure 3: Experimental Design framework chart

4. Expected contribution and Future direction

Looking forward to the future, producing the concept maps can be universal at school. Teachers can use concept maps to be a tool preparing to teaching, and Cumulative teaching files, as a teaching language. The transmission of knowledge, the concept maps not only can become the basis of teaching, but also a kind of modern teaching methods. Let students take the initiative in constructing a concept map as learning strategy, and enhance student's capacity of organizations and links Teachers in all subjects can link the horizontal and the vertical subjects together; integrate the nine-year integrated curriculum in various fields of related knowledge.

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