

INTEGRATION OF MIND MAPPING AND PROBLEM-BASED LEARNING INSTRUCTIONAL MODEL TO ENHANCE ANCIENT CHINESE READING SUMMARIZING ABILITY FOR UNDERGRADUATE STUDENT IN SOUTHWEST JIAOTONG UNIVERSITY



¹Zhang Jie, ²Areewan Iamsa-ard, ³Wapee Kong-In and ⁴Suriya Phankosol

Bansomdejchaophaya Rajabhat University, Bangkok, Thailand

¹zhangjie.bsru@hotmail.com

Received: September 15, 2023; **Revised:** November 20, 2023; **Accepted:** December 1, 2023

Abstract

The purposes of this research were to 1) To examine the factors affecting ancient Chinese reading summarizing ability of undergraduate students in Sichuan Province, 2) To develop mind mapping and problem-based learning instructional model for ancient Chinese reading summarizing ability of the undergraduate students in Southwest Jiaotong University, and 3) To study the result of mind mapping and problem-based learning instructional model for ancient Chinese reading summarizing ability of the undergraduate students in Southwest Jiaotong University. The Sample Group are the 21 students who enroll in ancient Chinese course from class 1 in Southwest Jiaotong University in semester 2 academic year 2022 are obtained by simple random sampling. Data were statistically analyzed by mean, standard deviation, data analytics statistics for confirmation of instructional model and data analytics statistics for scoring rubric.

The results were found that. Answer by the 3 objectives 1) Analysis results serving objective 1–To examine the factors affecting ancient Chinese reading summarizing ability of undergraduate students in Sichuan Province. The Results of Questionnaire and Interview founded two factors: Internal factors can be concluded into two parts, i.e., physical ones and psychological ones and external Factors can be concluded into three parts, i.e., teacher, teaching methods, and evaluation. Teacher, 2) Analysis results serving objective 2–to develop the instructional model of mind mapping and problem-based learning for ancient Chinese reading summarizing ability of undergraduate students in Southwest Jiaotong University Overall, the 5 components of the instructional model – principle and rationale, objectives, contents, methods of teaching & materials, and evaluation are unanimously confirmed by 5 specialists or 100% of all specialists based on appropriateness in 4 areas: utility, feasibility, propriety, and accuracy. Part 3: Analysis results serving objective 3–to examine the result of mind mapping and problem-based learning instructional model on undergraduate students' ancient Chinese reading summarizing ability After testing the research hypothesis using t-test for one-sample group, the results from t-test shows t-value of -23.238 which is higher than t-

¹Student in Curriculum and Instruction Program, Bansomdejchaophaya Rajabhat University, Bangkok, Thailand

²Associate Professor Dr., in Curriculum and Instruction Program, Bansomdejchaophaya Rajabhat University, Bangkok, Thailand

³Assistance Professor, Dr., in Curriculum and Instruction Program, Bansomdejchaophaya Rajabhat University, Bangkok, Thailand

⁴Associate Professor, Dr., in Curriculum and Instruction Program, Bansomdejchaophaya Rajabhat University, Bangkok, Thailand

distribution (20) and p value = .000 ($*p < 0.05$). Then, it can be summarized that the given treatment influences students' ancient Chinese reading summarizing ability at significance level 0.000. Moreover, the relative developmental scores of individual students' ancient Chinese reading summarizing ability are generally found at Very High level (DS = 76.36). There are 9 students or 42.86% of all students at "Very High" developmental level of ancient Chinese reading summarizing ability of total 4 dimensions; 9 students or 42.86% at "High" developmental level; 3 students or 14.28% at "Moderate" developmental level

Keywords: Communicative Language Teaching, Autonomous Learning, Oral Mandarin Proficiency

Introduction

China has a long history and culture, which is a prominent feature of China. "The Chinese nation has a profound cultural tradition, has formed a distinctive ideological system, and embodies the knowledge, wisdom and rational thinking accumulated by the Chinese people for thousands of years. This is China's unique advantage (Xi, 2016)." To adhere to China's cultural self-confidence and realize the great idea of rejuvenating Chinese culture, it is very important to learn ancient Chinese. Since the appearance of oracle bone inscriptions more than 3000 years ago, ancient China began to record the history, thoughts and culture of the Chinese people in writing. The importance of ancient Chinese curriculum has been attached by the state, society, schools and students of China. "As one of the core basic courses for Chinese Majors in Colleges and universities, ancient Chinese shoulders the important task of inheriting Chinese excellent traditional culture" (Guo, 2021). Ancient Chinese course is also one of the core basic courses of Teaching Chinese to Speakers of Other Languages major. In the Teaching Chinese to Speakers of Other Languages major of Southwest Jiaotong University, students are required to study ancient Chinese course for a full two years, and up to 4 class-hours a week, and 256 class-hours in total in 2 academic years, which is the course with the most student hours. Therefore, it is very necessary to explore the current situation and methods of undergraduate students' learning ancient Chinese, develop a new teaching model of ancient Chinese course in universities, help students develop their interest in learning ancient Chinese and improve the efficiency and effect of learning ancient Chinese. The contents of ancient Chinese course are very rich, including anthology, grammar, writing, phonology, exegesis and Chinese history. Anthologies correspond to the purpose of reading ancient articles, while grammar, writing, phonology, exegesis and Chinese history correspond to the knowledge of ancient Chinese (Gao, 2021). Among the two teaching purposes of reading ancient articles and learning ancient Chinese knowledge, the former has a very important and practical position. Ancient Chinese is one of the basic courses in the Department of Chinese language and literature, and its teaching purpose is to cultivate students' ability to read ancient Chinese books (Wang, 1999: preface). Learning ancient Chinese is to cultivate and improve the ability to read ancient documents (Zhang, 2004). And the purpose of ancient Chinese course is to cultivate and improve students' ability to read ancient books (Song, 2021). Thus, the importance of ancient Chinese reading ability is very prominent.

However, according to the situation of Southwest Jiaotong University, where the researcher of this study is working as a teacher of ancient Chinese, the ancient Chinese reading ability of undergraduate students needs to be improved. There is still room for undergraduate students of Southwest Jiaotong University to improve their ancient Chinese reading ability. There are 3 famous universities to have the same curriculum of Ancient Chinese in Sichuan Province, and they are Sichuan University, Southwest Minzu University and Southwest Jiaotong University. So, the researcher of this study has made questionnaires for about 180 students and 6 lectures of ancient Chinese course in the three universities and have found that undergraduate students think ancient Chinese reading is very important and not easy for them

and improvement for the teaching and learning the course is needed.

Problem-based learning is also an effective way in teaching and learning. There are three prominent features of problem-based learning, i.e., problems are used to stimulate learning, teachers act as facilitators, and group work is used to stimulate interaction (K. Khadjooi & K. Rostami, 2011). Therefore, in problem-based learning, students are the center of the learning process. Learning is carried out in small collaborative groups, and teachers act as facilitators rather than traditional knowledge imparters. When students study independently, they gain new knowledge and experience in analyzing and solving problems (D. Gijbels, F. Dochy, & P. Van den Bossche, 2005). The problem-based learning model promotes independent and context dependent learning, which is considered to be helpful to improve students' mastery of knowledge (Skelin, S., Schlueter, B., Rolle, D. & Gaedicke, G., 2008). And proponents of the problem-based learning model believe that by providing real practical problems in a peer supported group environment, learners can better apply their knowledge after completing their studies. Research shows that problem-based learning provides students with some advantages, such as improved motivation, teamwork skills, improved critical thinking ability, improved knowledge retention, and better organization and integration of new knowledge (Gonzalez, L., 2019). Problem-based learning has also been widely used in teaching activities and achieved good results. Students can improve the efficiency and accuracy of reading with the help of PBL (Wang, Y., Wang, J. & Sheng, H., 2015). PBL can significantly improve students' English reading performance, and significantly improve the participants' active learning ability and comprehensive cognitive processing ability (Lin, 2018). The application of PBL model among English majors is effective in teaching and learning English text reading comprehension (Alek, 2019).

It has been proved feasible and effective to integrate mind mapping with Problem-Based Learning to develop a new teaching model. The integration of mind mapping and PBL can enable students to memorize and understand the most important formulas, and the teaching effect is good (Yang, Liu & Tian, 2020). The teaching method of PBL integrated with mind mapping has a remarkable effect in the teaching of traditional Chinese medicine nursing technology (Liu, 2022). The teaching method of PBL integrated with mind mapping has a remarkable effect in the teaching of traditional Chinese medicine nursing technology (Liu, 2022).

This kind of research on teaching model with mind mapping and Problem-Based Learning is more applied to medical education. However, there is no such research on applying Mind Mapping and PBL instructional model in reading teaching and learning. Therefore, this thesis will do some research on it.

Objectives

1. To examine the factors affecting ancient Chinese reading summarizing ability of undergraduate students in Sichuan Province.
2. To develop mind mapping and problem-based learning instructional model for ancient Chinese reading summarizing ability of the undergraduate students in Southwest Jiao tong University.
3. To study the result of mind mapping and problem-based learning instructional model for ancient Chinese reading summarizing ability of the undergraduate students in Southwest Jiao tong University.

Material and Method

Literature review

Theories of Instructional Model Development

Instruction is the intentional facilitation of learning toward identified learning goals (Smith & Ragan, 2004, p. 4). Development of instructional models, sometimes also known as instructional design (ID), is a procedural system for developing education and training programs in a consistent and reliable manner (Gustafson & Branch, 2002, p. 17). And Smith and Ragan (2004, p. 4-8) thought instructional design refers to the systematic and reflective process of transforming learning and teaching principles into instructional materials, activities, information resources, and evaluation plans, and can also be defined as describing the process involved in the systematic planning of instruction. Reiser and Dempsey (2007, p.94-131) hold the view that instructional design is defined as a system program that creates learning experiences, courses, modules, and materials for education and training programs so as to support significant acquisition, improvement, and application of knowledge, skills, and abilities. And Tracey, Hutchinson and Grzebyk (2014) said, traditionally, it is a process driven field, especially based on system methods.

Mind Mapping Instruction

The Mind Mapping technique was first founded by Tony Buzan as a non-linear method of making meaningful and logical connections between two or more different concepts (Buzan, 1972; Buzan and Buzan, 1995). Buzan, T.& Buzan, B. (2010, p.31) define a mind map as a graphic representation of radiant thinking. Radiant thinking is the process through which the human brain thinks and generates ideas. Mind mapping is an outline in which major categories radiate from the central image and minor categories are depicted as branches of larger branches (John, 2004). It's a non-linear, network-structured representation of one's thoughts, most often with visual accompaniments, which is organized by a specific starting idea (a root response) and a graph/network of ideas emanating from it (Mento, Martinelli, & Jones, 1999). Tony Buzan believed Mind Mapping technique could be applied to a whole range of human daily activities, and that would mirror the creativity and radiance of our thought processes (Buzan, 2018, p.5). And he compared the characteristics of Conventional Note-taking and Mind Mapping as the following Table 2.4 (Buzan, 2018, p.6). Compared with linear concept maps, mind maps are more global in methodology (Adnan & Ilias, 2012).

Summary: From the literature of the past five years, researchers have done a lot of study on the application of mind mapping in teaching, and they also highly recognize the effectiveness of mind mapping in teaching activities. It can be found that mind mapping can be applied to a variety of teaching courses, and can achieve good teaching results in its teaching activities and improve students' ability. And mind mapping also has a good effect on improving students' reading ability.

Problem-Based Learning Instruction

Problem-based approaches for learning have a long history, which are one of many instructional approaches that situate learning in a meaningful task, and Problem-based learning (PBL) is a part of the tradition of meaningful, experiential learning (Hmelo-Silver, 2004). In 1969, Barrows, an American professor of neurology, founded the PBL teaching mode, which implemented the group teaching method of combining students' self-study with guidance at that time. Since then, PBL has been widely used in medical schools. PBL was originally developed in medical schools and has been used in a variety of settings from middle school to professional education. PBL is a key experiential learning organized around the investigation, interpretation and resolution of meaningful problems. In PBL, students work in small collaborative groups to learn the knowledge needed to solve problems, while teachers act as

guides. PBL is very suitable for helping students become active learners, because it places learning in the real world and makes students responsible for their own learning.

Ancient Chinese Reading Summarizing Ability

In this thesis students' ancient Chinese reading summarizing ability refers to the students can: (1) catch the main idea of each paragraph, i.e., read each paragraph and find the main ideas; (2) interpret ideas and information, i.e., explain the meanings of ideas and information and generalize ideas and information not explicitly stated in the text; (3) integrate ideas and information, i.e., answer questions across related texts and compare ideas and information across related texts; and (4) evaluate and critique content, i.e., form judgement about content and offering both negative and positive analysis of the content, writing, and structure of a text.

Material and Method

This research used Mixed Method of Research. The method of this research is to study the characteristics of Mind Mapping and Problem-Based Learning Instructional Model and develop a mixed instructional model to enhance ancient Chinese reading summarizing ability for undergraduate students in Southwest Jiaotong University. This research is divided into 3 phases.

Phase 1 was conducted to answer research objective 1: To examine the factors affecting ancient Chinese reading summarizing ability of undergraduate students in Sichuan Province.

Population

Group 1: The students who formerly enroll the Ancient Chinese Course in semester 2 academic year 2022 from 3 universities in Sichuan Province

60 students from Sichuan University

60 students from Southwest Minzu University

60 students from Southwest Jiaotong University

Group 2: The lecturers who have been teaching Ancient Chinese Course from 3 universities in Sichuan Province

2 lecturers from Sichuan University

2 lecturers from Southwest Minzu University

2 lecturers from Southwest Jiaotong University

Research instrument

1. The questionnaire for students

2. The interview for the lecturers

Designing instrument 1

1. Study Principles and Methods of ancient Chinese course and factors affecting ancient Chinese reading summarizing ability.

2. Design a questionnaire on factors to enhance ancient Chinese reading summarizing ability for the students in Southwest Jiaotong University.

3. Present the draft of questionnaire to the advisors for checking correctness and completion.

4. Assess the validity of questionnaire on factors to enhance ancient Chinese reading summarizing ability for the students in Southwest Jiaotong University by 5 experts (List name from Appendix A) through Index of Item-Objective Congruence (IOC)

5. Design Likert 5-point rating scale questionnaire on the following score rating criteria.

Quality Validation

Using IOC by 5 experts to test the quality of questionnaire.

Data Collection

1. Ask for permission for data collection.

2. Collect data from the assigned students using the developed questionnaire.

Data Analysis

1. The factors affecting ancient Chinese reading summarizing ability obtained from the students are interpreted using MEAN interpretation criteria.

Descriptive Statistics i.e., Frequency, MEAN (\bar{x}), Standard Deviation (S.D.)

Designing instrument 2

1. Study literature on ancient Chinese reading summarizing ability, improve of ancient Chinese reading summarizing ability, and factors affecting the enhancement of ancient Chinese reading summarizing ability for undergraduates.

2. Design the draft of open-ended interview on factors affecting the enhancement of ancient Chinese reading summarizing ability for undergraduates.

3. Present the draft of open-ended interview to the advisors for checking correctness and completion.

4. Assess the validity of open-end interview on factors affecting the enhancement of ancient Chinese reading summarizing ability for the undergraduates in Southwest Jiaotong University by 5 experts

Data Collection

1. Ask for permission for data collection.

2. Collect data from the assigned lecturers using the developed interview.

Data Analysis

Content analysis

Expected Output Phase 1

Obtain important information that is used as a basis for examine the internal factors and external factors to enhance ancient Chinese reading summarizing ability for undergraduate students in Sichuan Province from the former students and lecturers. And take the result to develop Mind Mapping and Problem-Based Learning Instructional Model.

Phase 2 was conducted to answer research objective 2: To develop mind mapping and problem-based learning instructional model for ancient Chinese reading summarizing ability of undergraduate students in Southwest Jiaotong University.

Conformity Assessment Form of Mind Mapping and Problem-Based Learning Instructional Model in terms of accuracy standard, propriety standard, feasibility standard, and utility standard.

Designing instrument (the questionnaire for IOC)

1. Study related concepts, principles, process about developing instructional model, including results in terms of factors affecting undergraduate students' ancient Chinese reading summarizing ability from research objective 1.

2. Design handout of Mind Mapping and Problem-Based Learning Instructional Model. which consists of the stable teaching activities and procedures. Such a developed instructional model with 5 components: 1) Principle & Rationale, 2) Objectives, 3) Contents, 4) Methods of teaching & Materials and 5) Evaluation, is in 4 aspects: 1) Utility Standard, 2) Feasibility Standard, 3) Propriety Standard and 4) Accuracy Standard

3. Design a questionnaire on confirming the appropriateness of the instructional model in terms of accuracy standard, propriety standard, feasibility standard, and utility standard.

4. Present the draft of open-ended interview to the advisors for checking correctness and completion.

5. Assess the validity of the questionnaire on confirming the appropriateness of the instructional model by 5 experts (List name in Appendix A) through Item-Objective Congruence)IOC)

6. Design the conformity assessment form of Mind Mapping and Problem-Based

Learning Instructional Model by assessment items form by the 5 experts (List name from Appendix A) in 4 aspects: 1) Utility Standard, 2) Feasibility Standard, 3) Propriety Standard and 4) Accuracy Standard

Data Collection

1. Ask for permission of data collection
2. Collect appropriateness of the instructional model in terms of accuracy standard, propriety standard, feasibility standard, and utility standard from the 5 experts using the developed conformity assessment form of Mind Mapping and Problem-Based Learning Instructional Model.

Data Analysis

Descriptive analysis, i.e., frequency and percentage. The acceptable items must not be less than 100%.

Expected Output Phase 2

The appropriateness of Mind Mapping and Problem-Based Learning Instructional Model is confirmed by experts for further implementation

Phase 3 was conducted to answer research objective 3: To study the result of mind mapping and problem-based learning instructional model on undergraduate students' ancient Chinese reading summarizing ability.

Population

The total of 42 students from 2 classes with different levels of proficiency – beginner, intermediate, and advanced, who enroll in ancient Chinese course in Southwest Jiaotong University. in semester 2 academic year 2022. Those sections involve are 21 students in class 1 and 21 students in class 2

The Sample Group

The 21 students who enroll in ancient Chinese course from class 1 are obtained by simple random sampling.

Research instruments

1. Lesson plans using Mind Mapping and Problem-Based Learning Instructional Model
2. Pretest and Posttest

Designing instrument 1

1. Study contents, objectives, methods of teaching, materials, evaluation and learner assessment methods
2. Design lesson plans by format given.
3. Present the lesson plan to the advisors for checking correctness, completion and improvement.
4. Assess the validity of the designed lesson plans by 5 experts through Item-Objective Congruence (IOC)
5. Conduct a try-out of the developed lessons plans with another group of samples for further improvements and implementation with the sample group.

Pretest and Posttest

1. Study the testing objectives aligned with Mind Mapping and Problem-Based Learning Instructional Model
2. Design pretest and posttest.
3. Present the developed pretest and posttest to the advisors for checking correctness, completion and improvement.
4. Assess the validity of the designed pretest and posttest by 5 experts through Item-Objective Congruence (IOC)
5. Conduct a try-out of the developed lessons plans with another group of samples for further improvements and implementation with the sample group

Data Collection

1. Ask for permission of data collection.
2. Collect students' learning outcomes by using pretest before the experiment.

3. Carry out the experiment.
4. Collect students' learning outcomes by using posttest after the experiment.

Data Analysis

Descriptive statistics – MEAN and standard deviation

Inferential statistics – Paired t-test for dependent samples

Relative Developmental Scores

Expected Output Phase 3 (Pretest-Posttest)

Results of implementing Mind Mapping and Problem-Based Learning Instructional Model – students' learning outcomes.

Results and Discussion

In the study of “Integration of Mind Mapping and Problem-Based Learning Instructional Model to Enhance Ancient Chinese Reading Summarizing Ability for Undergraduate Students in Southwest Jiaotong University”, the researcher studied the documents concerning the following.

Part 1: Analysis results serving objective 1–To study the factors affecting ancient Chinese reading summarizing ability of undergraduate students in Sichuan Province.

This section presents analysis results serving objective 1 using table and description in terms of MEAN, standard deviation, interpretation (Level of Attitude), and ranking of all factors in overview. After that, items of all factors are presented likewise

Common data of the respondent in Overview (N-180)

The common data of the respondent in overview shows that the most gender is female, representing 78.9 % of the total participants. The male respondents make up 21.1% of the total. The age distribution is relatively concentrated. The most age is 20 yrs., 41.1% of the respondents belong to this category.

The result of questionnaire from students in overview. (N-180)

The Indicates that internal factors affecting ancient Chinese reading summarizing ability of undergraduate students in Sichuan Province overall found at high level ($\bar{x}=3.76$). Considering only each item, it was found that No.14 Students believe that friendly cooperation and interaction between students are necessary is the highest mean ($\bar{x}= 4.51$), followed by No.13 Students think the interaction between teachers and students is necessary ($\bar{x}=4.18$) and the fewest mean is No.10 Students can actively follow the teacher's teaching steps ($\bar{x}=3.14$).

For external factors affecting ancient Chinese reading summarizing ability of undergraduate students in Sichuan Province overall found at high level ($\bar{x}=3.94$). Considering only each item, it was found that No.26 the proposal and resolution of problems can stimulate students' learning, thinking and discussion is the highest mean ($\bar{x}= 4.57$), followed by No.25 analyzing the structure of the article and presenting it in a graphic and textual manner is beneficial for students' information processing ($\bar{x}=4.56$) and the fewest mean is No.22 the teaching materials are of interest to students, and conducive to students' seeking more knowledge ($\bar{x}=3.08$).

The Common data of the respondent in A. Sichuan University. (N-60)

The common data of the respondent in Sichuan University shows that the most gender is female, 70 %. The most age is 19 yrs., 50.0 %

The result of questionnaire from students in A. Sichuan University. (N-60)

The Indicates that internal factors affecting ancient Chinese reading summarizing ability of undergraduate students in Sichuan University found at high level ($\bar{x}=3.72$). Considering only each item, it was found that NO.14 students believe that friendly cooperation and interaction between students are necessary is the highest mean ($\bar{x}= 4.72$), followed by

NO.5 students think that ancient Chinese reading summarizing ability is very useful. ($\bar{x}=4.50$) and the fewest mean is NO.6 students believe that the ancient Chinese course is moderately difficult ($\bar{x}=3.23$).

For external factors affecting ancient Chinese reading summarizing ability of undergraduate students in Sichuan University found at high level ($\bar{x}=3.79$). Considering only each item, it was found that NO.26 the proposal and resolution of problems can stimulate students' learning, thinking and discussion is the highest mean ($\bar{x}=4.67$), followed by NO.25 analyzing the structure of the article and presenting it in a graphic and textual manner is beneficial for students' information processing ($\bar{x}=4.62$) and the fewest mean is NO.22 The teaching materials are of interest to students, and conducive to students' seeking more knowledge ($\bar{x}=3.30$).

The Common data of the respondent in B. Southwest Minzu University. (N-60)

The common data of the respondent in Southwest Minzu University shows that the most gender is female, 85 %. The most age is 20 yrs., 50 %.

The result of questionnaire from students in B. Southwest Minzu University. (N-60)

Indicates that internal factors affecting ancient Chinese reading summarizing ability of undergraduate students in Southwest Minzu University found at high level ($\bar{x}=3.97$). Considering only each item, it was found that NO.1 students think that ancient Chinese course is very important is the highest mean ($\bar{x}=4.47$), followed by NO.13 students think the interaction between teachers and students is necessary ($\bar{x}=4.33$) and the fewest mean is NO.7 Students believe that the learning objectives of ancient Chinese course are clear. ($\bar{x}=3.42$).

For external factors affecting ancient Chinese reading summarizing ability of undergraduate students in Southwest Minzu University found at high level ($\bar{x}=4.13$). Considering only each item, it was found that NO.34 the teaching atmosphere between the teacher and students is very friendly is the highest mean ($\bar{x}=4.53$), followed by NO.20 it is very important for the teacher to objectively evaluate students' performance and learning effects. ($\bar{x}=4.52$), NO.25 analyzing the structure of the article and presenting it in a graphic and textual manner is beneficial for students' information processing ($\bar{x}=4.52$), and NO.26 the proposal and resolution of problems can stimulate students' learning, thinking and discussion ($\bar{x}=4.52$), and the fewest mean is NO.31 teaching activities can fully display students' personalized learning outcomes and satisfy students' sense of learning achievement. ($\bar{x}=3.45$).

The Common data of the respondent in C. Southwest Jiaotong University. (N-60)

The common data of the respondent in C. Southwest Jiaotong University, the most gender is female, 81.7 %. The most age is 21 yrs., 30.0 %

The result of questionnaire from students in C. Southwest Jiaotong University. (N-60)

Indicates that internal factors affecting ancient Chinese reading summarizing ability of undergraduate students in Southwest Jiaotong University found at high level ($\bar{x}=3.60$). Considering only each item, it was found that NO.14 students believe that friendly cooperation and interaction between students are necessary is the highest mean ($\bar{x}=4.52$), followed by NO.11 students can actively participate in classroom activities ($\bar{x}=4.03$) and the fewest mean is NO.10 students can actively follow the teacher's teaching steps ($\bar{x}=2.47$).

For external factors affecting ancient Chinese reading summarizing ability of undergraduate students in Southwest Jiaotong University found at high level ($\bar{x}=3.90$). Considering only each item, it was found that NO.25 Analyzing the structure of the article and

presenting it in a graphic and textual manner is beneficial for students' information processing is the highest mean ($\bar{x}=4.53$), followed by NO.26 The proposal and resolution of problems can stimulate students' learning, thinking and discussion ($\bar{x}=4.52$) and NO.30 Classroom activities are challenging to some extent and can fully mobilize students' subjective initiative ($\bar{x}=4.52$), and the fewest mean is NO.22 The teaching materials are of interest to students, and conducive to students' seeking more knowledge ($\bar{x}=2.48$).

The result of questions

The result of questions from 6 lecturers from Sichuan University, Southwest Minzu University, and Southwest Jiaotong University found that:

No.1 Most lecturers study ancient Chinese major, while a small number of lecturers study language related majors with a background in ancient Chinese knowledge and enjoy this course.

No.2 Most lecturers believe that students work hard in their studies, but they think that the ancient Chinese course is difficult and not active in class.

No.3 All lecturers think ancient Chinese reading summarizing ability is essential and important.

No.4 Most lecturers mainly let students to read after class due to class time limitations. Although a small number of teachers teach ancient Chinese reading in the classroom, their teaching methods need to be improved.

No.5 Most lecturers believe that increasing the opportunities and time for students to participate in discussions and group activities in the classroom is good, such as group discussion, etc.

No.6 The lecturers think many methods can stimulate students' thinking and exploration of knowledge, such as questions in class, pre class and post class thinking questions, or group discussion.

No.7 Some lecturers believe that classroom presentations, poster displays, and other methods are good ways to showcase students' learning outcomes, satisfy their sense of academic achievement, and pay attention to process evaluation.

No.8 All lecturers think PBL is a good teaching method and it's a good try to teach ancient Chinese course with it.

No.9 All lecturers think mind map is a clear, vivid, and intuitive way to teach and learn, and most lecturers believe it's a good try to apply mind map in ancient Chinese teaching.

No.10 All lecturers think it's an innovative teaching model combining mind mapping with problem-based learning (PBL), and it's a good try to teach ancient Chinese with the new model, though some lecturers believe it's a challenge.

Results of Questionnaire and Interview

The indicates that there are 5 internal factors and 5 external factors taking an important role in enhancing ancient Chinese reading summarizing ability according to students' opinion while lecturers provide 4 internal factors and 5 external factors.

After synthesizing data from both group of informants, the internal factors to support enhancing ancient Chinese reading summarizing ability include 1) students' working hard in this course, 2) students' actively participating in classroom, 3) students' knowing the importance of the course, 4) students' knowing the usefulness of ancient Chinese reading summarizing ability, and 5) students' will to cooperate and interact with others. As for the external factors, they refer to 1) teachers' being lively and highly knowledgeable with teaching skills, 2) graphic and textual manner in class to analyzing the structure of the articles, 3) the proposal and resolution of problems in class to stimulating students' learning, thinking and discussion, 4) more discussion, communication, and group work being carried out in class, and 5) both process evaluation and summative evaluation to grade students.

Analysis conclusion

Conclusion

Part 1: Analysis results serving objective 1–*To examine the factors affecting ancient Chinese reading summarizing ability of undergraduate students in Sichuan Province.*

Results of Questionnaire and Interview

The factors affecting ancient Chinese reading summarizing ability of undergraduate students in Sichuan Province include two factors: internal factors and external factors. The results of data analysis on student data show that “Students believe that friendly cooperation and interaction between students are necessary” and “Students think that ancient Chinese reading summarizing ability is very useful” are the most influential internal factors, and “The proposal and resolution of problems can stimulate students' learning, thinking and discussion” and “Analyzing the structure of the article and presenting it in a graphic and textual manner is beneficial for students' information processing” are the most influential external factors. Teachers' opinions also reflect the internal factors, such as, students work hard in their studies and ancient Chinese reading summarizing ability is essential and important.

Internal factors can be concluded into two parts, i.e., physical ones and psychological ones. Physical:1) Students are working hard in this course, and 2) Students are actively participating in class. Psychological:1) Students know the importance of the ancient Chinese course, 2) Students know the usefulness of ancient Chinese reading summarizing ability, and 3) Students are willing to cooperate and interact with others.

External Factors can be concluded into three parts, i.e., teacher, teaching methods, and evaluation. Teacher: Teachers are highly knowledgeable and willing to improve teaching methods and skills. Teaching methods:1) Graphic and textual manner in class are helpful for analyzing the structure of the articles, 2) The proposal and resolution of problems in class can stimulate students' learning, thinking and discussion, and 3) More discussion, communication, and group work should be carried out in class. Evaluation: Both process evaluation and summative evaluation are used to grade students.

Part 2: Analysis results serving objective 2–*to develop the instructional model of mind mapping and problem-based learning for ancient Chinese reading summarizing ability of undergraduate students in Southwest Jiaotong University*

Overall, the 5 components of the instructional model – principle and rationale, objectives, contents, methods of teaching & materials, and evaluation are unanimously confirmed by 5 specialists or 100% of all specialists based on appropriateness in 4 areas: utility, feasibility, propriety, and accuracy.

Part 3: Analysis results serving objective 3–*to examine the result of mind mapping and problem-based learning instructional model on undergraduate students' ancient Chinese reading summarizing ability*

After testing the research hypothesis using *t*-test for one-sample group, the results from *t*-test shows *t*-value of -23.238 which is higher than *t*-distribution (20) and *p* value = .000 (**p* < 0.05). Then, it can be summarized that the given treatment influences students' ancient Chinese reading summarizing ability at significance level 0.000. Moreover, the relative developmental scores of individual students' ancient Chinese reading summarizing ability are generally found at Very High level (DS = 76.36). There are 9 students or 42.86% of all students at “Very High” developmental level of ancient Chinese reading summarizing ability of total 4 dimensions; 9 students or 42.86% at “High” developmental level; 3 students or 14.28% at “Moderate” developmental level.

Discussions

Part 1: Analysis results serving objective 1–*to study the factors affecting ancient Chinese reading summarizing ability of undergraduate students in Sichuan Province*

Regarding the results, the factors affecting ancient Chinese reading summarizing ability of undergraduate students in Sichuan Province can be discussed as follows.

According to the results of the student questionnaire survey, the factors influencing ancient Chinese reading summarizing ability of undergraduate students in Sichuan Province are divided into internal factors and external factors:

1. Internal factors:

All internal factors affecting ancient Chinese reading summarizing ability of undergraduate students in Sichuan Province are generally found at high level ($\bar{x}=3.76$). Considering only each item, it was found that **No.14** “Students believe that friendly cooperation and interaction between students are necessary” is the highest mean ($\bar{x}=4.51$), followed by **No.13** “Students think the interaction between teachers and students is necessary” ($\bar{x}=4.18$), and the third one is **No.5** “Students think that ancient Chinese reading summarizing ability is very useful” ($\bar{x}=4.15$), and the fewest mean is **No.10** “Students can actively follow the teacher's teaching steps” ($\bar{x}=3.14$).

From the data above, students attach great importance to cooperation and interaction between students and teacher-student interaction, and they fully recognize the importance of ancient Chinese reading summarizing ability. This not only indicates that they have a strong desire to improve their ancient Chinese reading summarizing ability, but also indicates that they are not satisfied with the traditional classroom teaching model of "teacher speaking, students listening", and they have a strong willingness to engage in classroom interaction and exert subjective initiative to enhance their ancient Chinese reading summarizing ability, which also support the necessity of the development of the mind mapping and problem-based learning instructional model in this study and the potential effectiveness of implement the model to enhance students' ancient Chinese reading summarizing ability.

2. External factors:

All external factors affecting ancient Chinese reading summarizing ability of undergraduate students in Sichuan Province are generally found at high level ($\bar{x}=3.94$). Considering only each item, it was found that **No.26** “The proposal and resolution of problems can stimulate students' learning, thinking and discussion” is the highest mean ($\bar{x}=4.57$), followed by **No.25** “Analyzing the structure of the article and presenting it in a graphic and textual manner is beneficial for students' information processing” ($\bar{x}=4.56$), and the third one is **No.24** “The teaching method is lively and vivid, attracting students' attention through visual forms” ($\bar{x}=4.46$), and the fewest mean is **No.22** “The teaching materials are of interest to students, and conducive to students' seeking more knowledge” ($\bar{x}=3.08$).

From the data above, students believe that teaching method for problem-solving is more conducive to the learning of ancient Chinese reading, and a combination of graphics and text is more conducive to their understanding of the content of the article. At the same time, students aspire to lively and vivid teaching methods. The presentation of these external factors affecting ancient Chinese reading summarizing ability together prompted the determination of the researcher to develop the Mind Mapping and Problem Based Learning Instructional Model. Due to the characteristics of the Integration of Mind Mapping and Problem Based Learning Instructional Model, it can fully cover the most important external factors that affect ancient Chinese reading summarizing ability of underground students in Sichuan Province,

In short, both internal and external factors jointly affect the teaching of ancient Chinese course and the enhancement of undergraduate students' ancient Chinese reading summarizing ability. The Mind Mapping and Problem-Based Learning Instructional Model can not only fully meet the important internal factors affecting ancient Chinese reading summarizing ability of undergraduate students in Sichuan Province, but also fully meet its important external factors.

Part 2: Analysis results serving objective 2—to develop the instructional model of mind mapping and problem-based learning for ancient Chinese reading summarizing ability of undergraduate students in Southwest Jiaotong University

The 5 components of mind mapping and problem-based learning instructional model are confirmed by 5 specialists to be appropriate for further implementation. The confirmability results can be supported by unanimous agreement from the specialists across all components, utility, feasibility, propriety, and accuracy. Some details and discussion are shown as follows:

The Principle and Rationale of the instructional model were unanimously confirmed by all the 5 specialists in terms of its utility, feasibility, propriety, and accuracy. This suggests that the mind mapping and problem-based learning instructional model is robust and has a relatively sturdy theoretical foundation. And this also suggests that it is conducive to the enhancement of undergraduate students' ancient Chinese reading summarizing ability, which provides effective support in theory.

The Objectives of the instructional model were approved by all the 5 specialists. This unanimity indicates that the objectives set by the mind mapping and problem-based learning instructional model are clear, relevant and appropriate, and aimed at enhancing undergraduate students' ancient Chinese reading summarizing ability.

The Contents component were also agreed upon by all the 5 specialists, indicating that the teaching contents of the mind mapping and problem-based learning instructional model are suitable and well-designed for enhancing undergraduate students' ancient Chinese reading summarizing ability.

The Methods of Teaching & Materials were also received a 100% confirmability score from all the 5 specialists, which indicates that the teaching methods, teaching activities and teaching resources of the mind mapping and problem-based learning instructional model are well-designed, useful, feasible, proper, accurate, and helpful for enhancing undergraduate students' ancient Chinese reading summarizing ability.

The Evaluation component was also unanimously confirmed by all 5 specialists, emphasizing the effectiveness and appropriateness of the evaluation and feedback mechanisms of the mind mapping and problem-based learning instructional model to assess and enhance undergraduate students' ancient Chinese reading summarizing ability.

In conclusion, the unanimous confirmation by all the 5 specialists in terms of utility, feasibility, propriety, and accuracy shows the robustness and adaptability of mind mapping and problem-based learning instructional model. It suggests, without doubt, that this instructional model is well-designed and can effectively enhance undergraduate students' ancient Chinese reading summarizing ability.

Part 3: Analysis results serving objective 3—*To study the result of mind mapping and problem-based learning instructional model for ancient Chinese reading summarizing ability of the undergraduate students in Southwest Jiaotong University.*

Changes and development of students' ancient Chinese reading summarizing ability as results of providing the treatment – *mind mapping and problem-based learning instructional model* can be explained by the following supportive factors.

The First, mind mapping and problem-based learning instructional model can greatly improve students' classroom concentration. Because this instructional model is student-centered, and students are required to exert subjective initiative, actively think, and explore discoveries in order to solve problems, rather than passively accepting knowledge imparted by teachers. Every student got 1 (= high attention) in the Form of Attention Class. And among the 21 students who participated in the teaching experiment, 19 students or 90.5% of them stated in the post experiment Satisfaction Questionnaire that their classroom concentration have been significantly improved. From this, it can be seen that the mind mapping and problem-based learning instruction model has an important promoting effect on the improvement of students' classroom concentration, thereby enhancing the students' ancient Chinese reading summarizing ability.

The Second, mind mapping and problem-based learning instructional model can greatly improve students' classroom participation. Because according to the instruction model's lesson plan, each unit is arranged with 8 teaching steps, which is with a very compact and orderly teaching rhythm and rich teaching activities. Basically, every teaching step requires students to engage in group activities, requiring careful discussion, collaboration, and

active participation, especially in the preparation of mind maps and classroom presentations. Each group got A in the Form of Observing Group Process. And among the 21 students who participated in the teaching experiment, 18 or 85.8% of the students stated in the post experiment Satisfaction Questionnaire that their classroom participation had significantly improved. From this, it can be seen that the mind mapping and problem-based learning instruction model has an important promoting effect on improving students' classroom participation, thereby enhancing the students' ancient Chinese reading summarizing ability.

The Third, mind mapping and problem-based learning instructional model can greatly improve the teaching atmosphere. Because this instructional model requires group students to work together to solve problems and achieve goals, and the atmosphere of group activities is friendly, cooperative, and positive. Teachers mainly play a guiding role in the teaching process, providing students with freedom, guidance, and encouragement. At the same time, in evaluating students, teachers not only rely on their performance in the exercises after class, but also consider their classroom performance, group activities, mind mapping, and classroom presentations. Among the 21 students participating in the teaching experiment, 21 or 100% of the students expressed satisfaction with this evaluation method in the post experiment Satisfaction Questionnaire, and 21 or 100% of the students expressed that teaching atmosphere is so good. From this, it can be seen that the mind mapping and problem-based learning instruction model has an important promoting effect on improving the teaching atmosphere, thereby enhancing the students' ancient Chinese reading summarizing ability.

To sum up, mind mapping and problem-based learning instructional model plays a significant role in improving students' classroom concentration, students' classroom participation, the teaching atmosphere and other aspects. These supportive factors work together to make the mind mapping and problem-based learning instructional model more in line with students' learning psychology and encourage them to exert more subjective initiative in ancient Chinese courses, helping them enhance their ancient Chinese reading summarizing ability.

References

- Adnan, A. H. M. & Ilias, N. (2012). "I think I' m an active learner": narrative-quantitative research on the metacognitive preparedness of first semester [college students]. *Proceedings of the International Conference on Active Learning (ICAL 2012), Universiti Teknikal Malaysia Melaka (UTeM)*, 1, 121-127.
- Alek, A. (2019). Fostering Undergraduate Students' Reading Performance in English Discourse through Problem-Based Learning Model. *Indonesian Journal of English Language Teaching and Applied Linguistics*, 4(1).
- Buzan, T. (1972). *Spore one: Structure in hyperspace, and other poems*. Suffolk: The Boydell Press.
- Buzan, T. & Buzan, B. (1995). *The mind map book*. London: BBC Books.
- Buzan, T. (2018). *Mind Map Mastery*. London: Watkins Publications.
- Buzan, T. & Buzan, B., (2010). *The Mind Map Book: Unlock your creativity, boost your memory, change your life*. Pearson, Harlow.
- D. Gijbels, F. Dochy & P. Van den Bossche. (2005). Effects of problem-based learning: A meta-analysis from the angle of assessment. *Review of educational research*, 75(1), 27-61.
- Gonzalez, L. (2019). The Problem-Based Learning Model. *Proceedings of the International Conference of Educational Innovation through Technology*, 180-183.
- Guo, H. (2021). Exploration and practice of the implementation path of "curriculum ideology and politics" in ancient Chinese. *Journal of Higher Education*, (27), 173-176.
- Gustafson, K. L., & Branch, R. M. (2002). What is instructional design? In R.A. Reiser & J. A. Dempsey (Eds.), *Trends and issues in instructional design and technology*, 16-25, Saddle River, NJ: Merrill/Prentice-Hall.

- Hmelo-Silver, C.E. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review*, 16(3), 235-266.
- Tracey, M. W., Hutchinson, A., & Grzebyk, T. Q. (2014). Instructional designers as reflective practitioners: Developing professional identity through reflection. *Educational Technology Research and Development*, 62, 315-334.
- John W. Budd. (2004). Mind Maps as Classroom Exercises. *The Journal of Economic Education*, 35:1, 35-46.
- K. Khadjooi & K. Rostami. (2011). Problem-based learning. *Gastroenterology and Hepatology from bed to bench*, vol.4, no.1, 12.
- Liu, W. (2022). Using PBL combined with mind map in the preceptorship of traditional Chinese medicine nursing technology. *China Higher Medical Education*, 04, 89-90.
- Mento, A. J., Martinelli, P., & Jones, R. M. (1999). Mind mapping in executive education: Applications and outcomes. *Journal of Management Development*, 18(4), 390–416.
- Reiser, R. A., & Dempsey, J. (2007). *Trends and issues in instructional design and technology* (2nd ed.). Upper Saddle River New Jersey: Pearson.
- Skelin, S., Schlueter, B., Rolle, D. & Gaedicke, G. (2008). Problem-based learning (PBL). *MONATSSCHRIFT KINDERHEILKUNDE*.
- Smith, P. L., & Ragan, T. J. (2004). *INSTRUCTIONAL DESIGN* (3rd ed.). Hoboken: John Wiley & Sons Inc.
- Song, L. (2021). A probe into the teaching methods of ancient Chinese course. *Journal of Dalian University*, (06), 140-144.
- Wang, L. (1999). *Ancient Chinese*. Beijing: Zhonghua Book Company.
- Wang, Y., Wang, J. & Sheng, H. (2015). Practice of PBL in the Reading Teaching Strategies. *ICITCE 2014 - INTERNATIONAL CONFERENCE ON INFORMATION TECHNOLOGY AND CAREER EDUCATION*, Volume 14, 01012, Xi, 2016.
- Yang, Q., Liu, K., & Tian, D. (2020). PBL mind mapping method applied to chemical dynamics teaching. *Guangzhou Chemical Industry*, (07), 135-136.
- Zhang, Q. (2004). On Ancient Chinese Teaching. *Journal of Yangzhou college of Education*, (01), 65-69.

