Effects of Questioning Method in Management Science Course to Promote Critical Thinking Ability for First-year Students in Zhengzhou University of Science and Technology

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Abstract
Background and Aims: This experimental research aimed to 1) Compare the students' critical thinking ability in management learning before and after learning through the Questioning Method; 2) Compare students' critical thinking ability after learning through the Questioning Method with the criterion determined of 70 Percent of full score. 3) Assess the student's satisfaction after learning through the Questioning Method. The sample for this study was 30 freshman students majoring in management science at a university in Henan Province, People's Republic of China. Which was derived from the questioning method. The research instruments were as follows: 1) Eight lesson plans using the questioning method. 2) A critical thinking ability test with reliability is 0.826. 3) Student satisfaction questionnaire with the reliability of student satisfaction is 0.964. After collecting and organizing experimental data, use software for data analysis. The statistics used for data analysis are the mean, standard deviation, and paired sample t-test of the sample.
Materials and Methods: The population of this study is 180 early childhood students (6 classrooms), who were enrolled in English courses. The sample of this study is 30 early childhood students (1 classroom) of JinshanXinyuan Preschool Zoucheng City in the academic year of 2023 which was selected by cluster random sampling method. Data was collected through listening rubrics and speaking rubrics and SPSS software was used to analyze the collected data, the data used for analysis were the mean value of samples, standard deviation, and single sample t-test.
Result: The results showed that 1) Critical thinking ability test scores of the students after learning through the questioning method (M= 22.60, S.D. =4.26) were higher than before Learning (M= 16.97, S.D. =4.12) at a statistically significant level of 0.01. 2) The critical thinking ability test scores of the students after learning through the questioning method were higher than the determined criterion of 70% at the 0.05 statistical significance level (M= 22.60, S.D. =4.26). 3) After learning through the questioning method, students' satisfaction was at a high level (M=4.59, S.D. = 0.54). Knowledge gained from this research is that using a questioning method which consists of 3 stages and 3 steps of teaching, can effectively improve critical thinking ability test scores of the students, stimulate students' interest in learning, develop students' independent learning ability, and meet their personalized learning needs. It is a new trend in the future of education.
Conclusion: According to the research results, we can draw the following conclusions: The average score and standard deviation of the students of 1 major in university who adopted the questioning method were higher than the standard of 70% at the level of statistical significance of 0.05. The questioning method can enhance the students' Critical Thinking Abilities.
Keywords: Questioning method; Critical thinking ability; Students'satisfation; Students majoring in management sciences

Introduction

In the 21st century, the world has developed with progress in continuous development. So far, more and more new industries have mushroomed and grown continuously. In people's vision, it is said that it is easier to start a business than to maintain a business. An enterprise will encounter many factors on the development of the road to good development the enterprise must establish an effective management mode, to manage an enterprise to promote the effective allocation of internal resources and optimize the internal structure of the enterprise, so as not to be eliminated by social competition. Therefore, the construction of a good enterprise management model requires management theory to

provide support. At present, the research on management theory in China is still in a stage of obvious lag, and the foundation of the research theory is relatively weak, there is still a huge difference between the research on management theory in advanced Western countries. With the rapid growth of the Chinese economy and the rapid rise of domestic enterprises, there is an urgent need for China to construct research management theory in line with China's special background. To effectively realize and achieve this purpose, we should construct the theory based on the Western advanced theory and the actual development of China. Therefore, China should follow three principles in the theoretical research of management science: scientific research, strengthening problem awareness, and constructing management science theory with Chinese characteristics based on the three aspects under the special background of China, to lay a stable foundation for the development of Chinese enterprises. The theory is rigid, and the actual development is active. Therefore, based on fully understanding the content and views of the Western advanced management theory, based on the basic national conditions of China's development, the two sides are effectively combined, to provide reference reference for the development of China's management mode (Lui & Low, 2009).

The study emphasizes the need for China to develop management theories that are rooted in both Western advancements and its unique developmental context, thereby strengthening the theoretical foundation and practical applicability of management in Chinese enterprises.

1. Management theory research lags behind

Current situation: As mentioned in the paragraph, at present, China's management theory research is still in a stage of obvious lag, and the research theoretical foundation is relatively weak. This shows that there is a significant gap between China and Western advanced countries in the research and development of management theory. This lag is not only reflected in the quantity and quality of theoretical innovation but also reflected in the integrity and systematization of the theoretical system. China's management theory research has not yet formed a theoretical system with extensive influence and guiding significance, which makes it difficult to effectively support the needs of the rapid development of Chinese enterprises.

2. Insufficient integration of management theory with the special background of China

The paragraph emphasizes that with the rapid growth of China's economy and the rapid rise of domestic enterprises, there is an urgent need to construct management theories that meet the special background of China. However, the current management theory research is still insufficient in combination with the actual development of China. Management theories often originate from specific social, economic, and cultural backgrounds, while China's special national conditions and cultural backgrounds make it difficult to directly apply Western management theories to achieve ideal results. Therefore, how to combine the Western advanced management theory with the actual situation of China to form a management theory with Chinese characteristics is an important gap in current research.

3. The combination of science and practice of management theory is not close enough

Current situation: As mentioned in the paragraph, the theory is rigid, while the actual development is active. This reflects the shortcomings of the current management theory in the combination of science and practice. The research of management theory often focuses on the construction of theoretical systems and logical deduction, but it may face various complex and changeable situations in practical application. Therefore, how to closely combine the scientificity of management theory with the actual management practice of Chinese enterprises, so that the theory can truly guide practice, is an important gap in current research.

A principle of Management is a basic professional course of business disciplines in most colleges and universities. It is a highly practical and applied subject that integrates the knowledge of sociology, economics, mathematics, psychology, philosophy, and other disciplines and is also the basis for students to learn other relevant professional courses. At present, most colleges and universities arrange for it to be offered in the first semester of freshman year. The teaching goal of Principles of Management is to help students fully understand the basic principles of management, master the basic functions and methods of

management, and get familiar with the general laws of management activities. Only when students master the general laws and principles of management, can they better understand the content of other specific management sciences. The "cramming" teaching is still implemented, and teachers are only limited to the teaching mode of "explaining principles on principles and methods on methods" in teaching, but the empty classroom teaching cannot allow students to truly absorb and understand the essence and intention of management, and cannot truly train new people with innovative thinking and entrepreneurial passion needed for social development. Therefore, in the context of the current era of entrepreneurship and innovation, the teaching of Principles of Management should be reformed accordingly. The author will put forward the reform ideas of Principles of Management curriculum based on the background of entrepreneurship and innovation (Wang & Wang, 2021

Research questions

1) How is the students' critical thinking ability before and after learning through the Questioning Method?

2) How is the students' critical thinking ability compared with the determined criteria at 70 percent full?

3) How is the student's satisfaction with the questioning method after learning through the Questioning Method?

Research objectives

1) To compare the students' critical thinking ability in management learning before and after learning through the Questioning Method;

2) To compare student's critical thinking ability after learning through Questioning Method with the criterion determined of 70 Percent of full score.

3) To assess the student's satisfaction after learning through the Questioning Method.

Literature Review

The literature review of this research is based on the influence of the use questioning method on the cultivation of the critical thinking ability of management science students in the School of Business Administration of Zhengzhou University of Science and Technology. In this chapter, the researchers discuss this definition according to the literature and also discuss the advantages, components, and teaching process of the question method. Critical thinking ability within the discipline covers the study of management activities and management theory, information access, decision making, planning and planning work, organizational design, human resource management, introduction to leadership, motivation, communication, control, and the innovative function of management.

1. The history and present situations of questioning methods in foreign countries

Hawley et al (2017) Questioning Method is an increasingly popular pedagogy in the college classroom. Students enrolled in an agricultural sales course were exposed to this teaching method through the completion of a semester-long sales project. The project requires students to work in pairs to develop a sales call plan and pitch the sale of an agricultural product or service to a potential customer. Following completion of the semester-long project, students were surveyed about their perceptions of learning using the Questioning Method, learning outcomes, and employability skills gained. Roughly half of the students (53%, n=19) recommended the instructor use problem-based activities in the course again. Additionally, students agreed the project made the subject matter more realistic (4.22 ± 0.72) and improved their comprehension (4.06 ± 0.58) on a five-point Likert scale. They agreed the ready, set, sell project helped develop preparation skills (4.06 ± 0.72), presentation skills (4.06 ± 0.72), and interpersonal skills (4.06 ± 0.67). These findings yield several recommendations, including the need for additional research measuring students' learning styles with

the Questioning Method and comparing the Questioning Method's effectiveness to other teaching methods used in agricultural sales courses.

Moi & Ruslan (2016) This research was conducted to evaluate the effects of Problem-based Learning (PBL) with the Thinking Maps (TM) teaching method (PBL-TM) on Fifth Graders' science critical thinking. The critical thinking skills evaluated were Comparing and Contrasting, Sequencing, and Identifying Cause and Effect in physical science. A quasi-experimental pre-test and post-test control group design was employed in the research. The sample consisted of 270 Fifth Graders (age 11 years old) from three primary schools in Tawau, Sabah, Malaysia who were all randomly selected and assigned to PBL-TM (n=90), PBL (n=90), and Conventional Problem Solving (CPS) (n=90) teaching groups. The 30-item Test of Science Critical Thinking was used as the pre-test and post-test. The three thinking maps used were Double Bubble Maps, Flow Maps, and Multi-Flow Maps. A MANCOVA was conducted on the post-test scores with students' pre-test scores as the covariates. The result indicated that students in the PBL-TM group significantly outperformed their counterparts in the PBL group who, in turn, significantly outperformed their counterparts in the CPS group in Comparing and Contrasting, Sequencing, and Identifying Cause and Effect. The findings suggest that thinking maps, which were explicitly infused into the questioning method are effective in promoting critical thinking among Fifth Graders in physical science lessons.

Tovar et al (2015) Doctor of nursing practice (DNP) graduates must be prepared to lead quality improvement (QI) initiatives in healthcare settings; however, effective and feasible teaching strategies pose a challenge for many DNP program faculties. This article describes a successful and practical questioning method exercise for students to work through the QI process using the Lean 8-step questioning method. Suggestions for faculty and recommendations for future activities are discussed.

2. The history and present situations of questioning methods in China

Fan (2024) In the traditional English teaching model, high school English teachers teach English to students the "filling duck" teaching method is used in learning time. In this model of teaching and learning, students rarely ask questions of the teacher when listening to the teacher, and the teacher also rarely asks questions of the students. In today's new curriculum reform, the traditional model of English teaching and learning has been unable to adapt to the development of English teaching and learning in the new era. The questioning method through the students to ask questions, let them answer questions, let them put forward the heart of the question, and promote students to teach the inner capacity of in-depth understanding and a firm grasp. The effective application of the questioning method in high school English lessons can stimulate students' enthusiasm for learning English, and enable students to better understand the contents of the teaching materials to be learned. Dig deeper to understand the writer's writing intentions. When asking questions to students, we should consider the content of the physical lessons learned, we should consider the knowledge and ability of students, and the questions should be in line with the reality of students. Not only can stimulate students' English thinking, but also does not make students feel difficult to take the next hand, no method to answer, and hit the heat of learning English, leading to a questioning method and learning method has not being used.

Qi (2022) In the teaching process, teachers can focus on students' preview plans, classify and integrate the questions raised by students reasonably, and then combine the knowledge points related to history textbooks to make teaching videos and short films and play them for students in class. Taking the relevant historical knowledge points of the Sui Dynasty as an example, teachers can expand after class around this content, encourage students to collect and carefully observe the pictures of the Grand Canal, and then organize the information collected by students, and then play it to students through multimedia, so that students can think while watching the information: "Is the opening of the Grand Canal a good thing or a bad thing?" Is that the reason? "After that, the teacher asks the students to find the answer to the question based on their understanding of history. This not only helps to maintain students' interest in learning but also can further strengthen students' thinking ability, while creating a more relaxed and pleasant teaching atmosphere, to obtain more ideal teaching effect. After students

have answered the above questions in combination with their understanding, teachers can lead students to complete the drawing of the mind map by combining the knowledge in history textbooks and courseware and guide students to continuously optimize the structure of historical knowledge in this process and promote the class significant improvement in teaching efficiency.

Conceptual Framework
The Independent variable is the Questioning Method.
The dependent variables are (1) Critical Thinking Abilities, and (2) Students' Satisfaction.
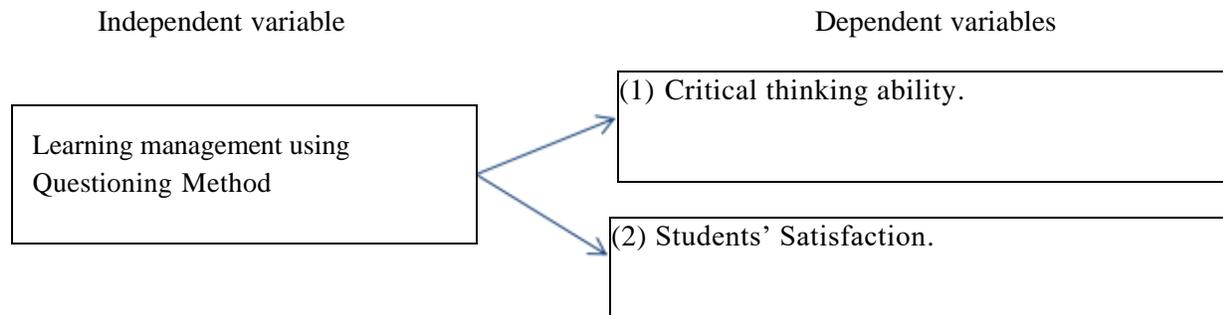
Independent variable   Dependent variables

Figure 1 Conceptual Framework

Methodology
1. Population and sample
The population in this study is 120 students (4 classes) in the School of Business Administration of Zhengzhou University of Science and Technology.
The sample in this study is 30 students (1 classroom) of 1 major in the School of Business Administration of Zhengzhou University of Science and Technology by cluster random sampling.
2. Research instruments:
Research instruments are the tools for collecting data. The research instruments which were used in this study are (1) Questioning Method Lesson plans. (2) The Critical Thinking Test. And (3) Questionnaire for students' satisfaction.
2.1 Questioning Method Lesson plans
There are 8 management science lesson plans (2 hours per lesson) for first-year students in the School of Business Administration at Zhengzhou University of Science and Technology and a total of time is 16 hours. The specific arrangement is shown in the table:

Table 1 Course content sheet

Lesson Plan	Topic	Time Duration
1	Make a decision	2 hours
2	Communication	2 hours
3	Organization	2 hours
4	Human resource management	2 hours
5	Leadership theory	2 hours
6	Encourage	2 hours
7	Controls	2 hours
8	The innovative functions of management	2 hours

The draft lesson plans mentioned earlier are assessed by 3 experiments regarding the appropriateness of each component of the draft lesson plans. The instrument used for evaluating appropriateness evaluation

is a five-point rating scale which ranges the level of appropriateness from very high level, high level, moderate level, low level, and very low level.

The appropriateness data collected from the evaluation form is analyzed by calculating mean scores and assigned the interpretation of appropriateness level as follows:

Table 2 Evaluating of appropriateness evaluation was a points rating scale Instrument for collecting data

Mean Scores	Interpretation of Appropriateness Level
4.51-5.00	Very high level
3.51-4.50	High level
2.51-3.50	Moderate level
1.51-2.50	Low level
1.00-1.50	Very low level

2.2 The Critical Thinking Test

The steps of constructing the Critical Thinking Test;

Step 1: Exploring the literature on critical thinking and first-year students' abilities. This involves researching existing studies to understand the different definitions, characteristics, and applications of critical thinking, as well as the current research status and challenges related to the impact of critical thinking on first-year students' ability.

Step 2: Study the relationship between critical thinking and question method. Study the Management Science course and the measurement to assess critical thinking abilities.

Step 3: Studying the construction of the Critical Thinking test and the relevant documents. Consideration the test focuses on purposes, types, and contents of the test. The construction of the test involves item analysis to clarify the item discrimination and item difficulty of the test, as well as the validity and reliability of the test.

Step 4: Analyzing the curriculum contents and the learning objectives by constructing the analysis table of curriculum regarding the coverage of objectives and content of the curriculum. The test items consisted of four types of cognitive domains: 1) Knowledge 2) Comprehension 3) Application 4) Analysis.

Step 5: Constructing the Critical Thinking test. The test consists of 30 items of multiple-choice questions, each of which has four alternatives with one correct answer.

Step 6: The draft test is presented to thesis advisors for their advice on the appropriateness, precision, accuracy, ambiguity, and wording of the test. After that, the draft test is revised according to the thesis advisors' suggestions. The test and the test evaluation form were offered to the three experts for the content validity check and suggestions such as the type of questions, accuracy of the test, and wording. The quality of the test was considered from the Index of Item Objective Congruence (IOC) obtained from the achievement test evaluation form.

Step 7: Analyzing the IOC index of the test items. The formula used to calculate the IOC index is:

$$IOC = \frac{\Sigma R}{N}$$

IOC means Index of Item Objective Congruence

ΣR means Summation of experts' opinion marks
N means several experts

If the Index of Item Objective Congruence (IOC) of each item of the test is higher than 0.5 that means it can be used in the test.

Step 8: Revise the test according to the experts' comments and suggestions.

Step 9: Measuring the item difficulty (p) and item discriminability (r) including reliability by trying out the test to students who had learned these contents.

Step 10: Analyzing each item of the test to find out the item difficulty (p) and item discriminability (r) including reliability. Item difficulty (p) should range from 0.20-0.80 and item discriminability (r) should be more than 0.20. The reliability of the test was computed using the formula of Kuder and Richardson formulas 20 and should be more than 0.7 (Kuder; & Richardson. 1939: 681-687).

2.3 Questionnaire for students' satisfaction

The following are the steps for constructing the questionnaires:

Step 1: Studying documents related to constructing questionnaires.

Step 2: Constructing a questionnaire. There are 3 sections;

Section 1: Record the students' personal information.

Section 2: The five-point scale Likert questionnaire ranges from very high, high, moderate, low, and very low. This section of the questionnaire consisted of 16 questions or statements asking about students' opinions toward the instruction. The statements of the questionnaire in this section are adapted from the student opinion questionnaire developed by the Department of General Education, the Ministry of Education (2542: 45).

Section 3: Open-ended questions asking students' opinions toward instruction in terms of the content of the course, the learning activity through the Question method, the instructional materials, assessment, and evaluation. Also, space was provided for additional opinions or other suggestions.

Step 3: The draft questionnaire is presented to thesis advisors for advice on the appropriateness, precision, accuracy, ambiguity, and wording of the questionnaire. After that, the draft questionnaire was revised according to the thesis advisors' suggestions. The evaluation form was offered to the three experts for the content check and suggestions.

Step 4: Revise the questionnaire according to the experts' comments and suggestions.

3. Data collection

The procedures of data collection are as follows:

1. The samples test before learning through the Questioning Method by using the critical thinking test.

2. The researcher records scores of pretesting.

3. The samples learn through the Questioning Method for 16 hours (8 lesson plans) in total.

4. After finishing 16 hours (8 lesson plans), the samples test by using the critical thinking test.

5. The researcher records scores of post-testing and analyzes scores before and after learning through the Questioning Method following the research objectives.

6. The samples complete a satisfaction assessment.

4. Data analysis

In this study, data is analyzed by using the statistical program according to the research objectives; 1) Compare Critical Thinking before and after Learning through the Questioning Method by using a t-test for the dependent sample. 2) Compare Critical Thinking with the criterion determined of 70 Percent of full score. And 3) Assess the student's satisfaction after Learning through the Questioning Method.

Results

Table 3 The result of comparing the different scores of critical thinking ability before and after learning through the questioning method.

Group	n	Pretest scores		Posttest scores		t	p
		M	S.D.	M	S.D.		
Experimental group	30	16.97	4.12	22.60	4.26	34.67*	0.01

*p<.05

As presented in Table 3, the mean score of the pretest of students' critical thinking ability was 16.97 (S.D =4.12) and the posttest of students' critical thinking ability was 22.60 (S.D =4.26). Moreover, it aimed to examine the different scores of before-and-after using questioning methods to enhance critical thinking ability. The result of this table showed that after learning through the questioning method in the classroom, posttest scores of students' critical thinking ability were greater than pretest scores at a .05 level of statistical significance ($t_{29} = 34.67$, $p=0.01 < .05$). The average scores of the study developed increasingly higher than pretest.

Table 4 The result of comparing the different scores of critical thinking ability after learning through the questioning method with the criteria set at 70 percent.

Group	N	Full score	Criteria score	M	S. D	t	p
Experimental group	30	30	21	22.60	4.26	2.06*	0.01

*p<.05

As presented in Table 4, the mean scores of t students' critical thinking ability after learning through the questioning method was 22.60 from a full mark of 30 and the standard deviation was 4.26 which was statistically higher than the criterion of 70% at .05 level of statistical significance ($t_{29}=2.06$, $p=0.01< .05$).

It can be seen that the critical thinking ability of the students who accept the questioning method is higher than 70%.

According to the research results, we can draw the following conclusions:
The average score and standard deviation of the preschool students who adopted the educational game teaching mode were higher than the standard of 70% at the level of statistical significance of 0.05. The educational game teaching method can enhance the preschool students' Communicative English Listening and Speaking Abilities.

Discussion

1. Students' critical thinking ability after learning through the questioning method is higher than before. First, deepen understanding. The questioning method encourages students to ask questions about the learning content. This active thinking process helps deepen the understanding of knowledge points. When asking questions, students need to sort out, analyze, and summarize what they have learned, to deepen their impression and understanding of knowledge points. By asking questions, students can grasp the internal logic and connection of knowledge more clearly and form a more complete knowledge system. Second, find the problem. In the learning process, the questioning method can help students find their doubts and blind spots in time. By asking questions, students can find out their problems in understanding, memory, and application of knowledge points, and then study and review in a targeted way. This kind of targeted learning method helps to improve the efficiency and effect of learning and reduce the time of ineffective learning. Third, consolidate the memory. Questioning helps to consolidate memories. When students ask questions, they need to review what they have learned, which in itself is a memory-strengthening process. At the same time, by answering

the questions raised by themselves, students can further deepen their memory and understanding of knowledge points. In addition, the method of questioning can also help students establish connections between knowledge points and form a more solid memory network. Fourth, stimulate interest. Questioning can stimulate students' interest in learning. When students have questions about the learning content, they will have a strong curiosity and thirst for knowledge, and then actively explore the answer to the question. This process of exploration can not only improve students' learning enthusiasm but also cultivate students' independent learning ability. Fifth, cultivate thinking. The questioning method helps to cultivate students' thinking ability. In the process of asking and answering questions, students need to carry out logical reasoning, inductive analysis, innovative thinking, and other complex thinking activities. These thinking activities help to improve students' thinking ability so that they can apply the knowledge more flexibly to analyze and solve complex problems. Sixth, improve expression skills. Questioning can also improve students' ability to express themselves. When asking questions, students need to clearly express their doubts and perplexities; When answering questions, students need to organize language, explain ideas, and demonstrate conclusions. These processes all contribute to improving student's oral and written presentation skills, enabling them to better communicate and communicate with others.

2. Students' critical thinking ability after learning through the questioning method is higher than 70 percent. Because the questioning method organizations online and face-to-face teaching activities Consists of 6 Steps:

2.1 Deepen understanding and explore actively. The questioning method encourages students to ask questions about the learning content. This active thinking process helps deepen the understanding of knowledge points. When asking questions, students need to sort out, analyze, and summarize what they have learned, to deepen their impression and understanding of knowledge points. By constantly asking and answering questions, students can grasp the internal logic and connection of knowledge more clearly, form a more complete knowledge system, and thus improve their academic performance.

2.2 Identify problems and correct them in time. The questioning method can help students find their doubts and blind spots in time. By asking questions, students can find out their problems in understanding, memory, and application of knowledge points, and then study and review in a targeted way. This kind of targeted learning style can help students correct mistakes in time and avoid losing points due to negligence in the exam, thus improving their academic performance.

2.3 Consolidate memory and enhance understanding. The questioning method helps to consolidate memories. When students ask questions, they need to review what they have learned, which in itself is a memory-strengthening process. At the same time, by answering the questions raised by themselves, students can further deepen their memory and understanding of knowledge points. In addition, the questioning method can also help students establish connections between knowledge points and form a more solid memory network, which is conducive to improving test scores.

2.4 Inspire interest and motivation. The questioning method can stimulate students' interest in learning. When students have questions about the learning content, they will have a strong curiosity and thirst for knowledge, and then actively explore the answer to the question. This process of exploration can not only improve students' learning enthusiasm but also cultivate students' independent learning ability, to promote the improvement of academic performance.

2.5 Cultivate thinking and improve ability. The questioning method helps to cultivate students' thinking ability. In the process of asking and answering questions, students need to carry out logical reasoning, inductive analysis, innovative thinking, and other complex thinking activities. These thinking activities can improve students' thinking ability, and make them more flexible in the face of complex problems to use the knowledge to analyze and solve, to get better results in the exam.

2.6 Improve presentation and communication skills. The questioning method can also improve students' ability to express and communicate. When asking questions, students need to clearly

express their doubts and perplexities; When answering questions, students need to organize language, explain ideas, and demonstrate conclusions. These processes all contribute to improving students' oral and written expression skills, enabling them to better communicate and communicate with others, thus receiving more help and support in the learning process.

3. After learning management using the questioning method, students can improve student satisfaction. First of all, the choice of questions. In the process of questioning, teachers should choose the appropriate question objects according to the individual differences and learning levels of students. For students with a poor foundation, some simple questions can be put forward to enhance their learning confidence; For students with a better foundation, they can ask more challenging questions to stimulate their thirst for knowledge. Through personalized questioning, students can feel the teacher's attention and respect, to improve their learning satisfaction. Second, avoid punitive questions. Teachers should avoid punitive questions when asking questions, that is, they should not use questions as a means of punishing students. Instead, teachers should view questioning as a positive form of evaluation, encouraging students to think and answer questions. When students give wrong answers, teachers should give appropriate guidance and correction instead of criticizing and accusing them. In this way, students' psychological pressure can be reduced, their enthusiasm to participate in class discussions can be improved, and their learning satisfaction can be improved. Third, give time to think. After asking questions, teachers should give students enough time to think. This not only enables students to better understand and analyze problems but also cultivates their ability to think independently. At the same time, in the process of waiting for students' answers, teachers can give appropriate prompts and guidance to help students find ways to solve problems. In this way, students can feel the care and support of teachers and improve their learning satisfaction. Fourth, make good use of study groups. Teachers can use study groups to allow students to discuss and communicate in groups. In group discussions, students can deepen their understanding of knowledge points by asking, answering, and discussing with each other. At the same time, teachers can also participate in group discussions and give appropriate guidance and help. This interactive way of learning can make students feel the fun and achievement of learning, and improve their satisfaction with learning. Fifth, the effectiveness of the questioning strategy. Teachers should pay attention to the effectiveness of questioning strategies when asking questions. For example, open questions can be used to encourage students to express their ideas and opinions. Inquiry-based questioning can also be used to guide students to find and solve problems independently. At the same time, teachers should also pay attention to the difficulty and relevance of the problem to ensure that the problem is challenging and inspiring. This can stimulate students' learning interest and thirst for knowledge, and improve their learning satisfaction. Sixth, feedback and encouragement. After students answer the questions, teachers should give timely feedback and encouragement. The teacher should praise and affirm the students who give correct answers. For students who give wrong answers, teachers should also give encouragement and support, and point out their shortcomings and directions for improvement. In this way, students can feel the care and support of teachers, enhance their learning confidence and motivation, and improve their learning satisfaction. Many scholars and researchers have conducted in-depth research on the question method to improve students' satisfaction. Dakowska (2005) says that the actual potential of discussion activity for developing an individual learner's speaking ability can be implemented only under certain conditions such as the topic is controversial enough to open different perspectives and interpretations, learners participate in the choice of the topic and are given enough communicative autonomy to be able to express their personal opinions and ideas, students are interested in the topic and their general knowledge is sufficient enough to discuss it (this may require appropriate preparation – studying relevant sources and processing the teacher's or peers' input), discussion is planned as a complex activity which combines working in pairs or groups and open-class or panel forms of interaction. Furthermore, Thornbury (2007) reminds us that the process of developing speaking skills consists of three stages: (1) awareness – learners are made aware of features of target language

knowledge, (2) appropriation – these features are integrated into their existing knowledge base, and (3) autonomy – learners develop the capacity to mobilize these features under real-time conditions without assistance. Learners at the advanced level of language proficiency are more likely to benefit from detailed descriptions of their speaking skills than from a single score that depicts their ability to communicate in general. The criteria used for any type of scoring usually take into account the categories of grammar, vocabulary, discourse management, and interactive communication. The specific, more detailed criteria may be defined within each category concerning the aims and character of the general evaluation procedure and the chosen spoken test format.

Overall, the system provides diverse learning resources, tasks, and activities of different difficulty levels, personalized learning paths, as well as feedback and support. Through these, the personalized needs of learners can be better met, promoting their learning outcomes and achievements. Compared with traditional teaching methods, students have significantly improved their academic achievements. Students are satisfied with the personalized learning experience and intelligent learning support of the questioning method, believing that the system can better meet their learning needs, and improve learning efficiency and quality. Improve student satisfaction.

Summary: According to the research results in Chapter 4, after using the questioning method for a certain period, learners generally have higher post-test scores than their pre-test scores before using the questioning method. This indicates that adaptive learning systems have a positive impact on the learning outcomes of learners.

Students believe that those who use questioning learning methods have achieved better results in knowledge acquisition, and problem-solving, which can effectively improve their learning outcomes. Positive empirical research results have been achieved in user satisfaction and learning achievement. It can be seen that the questioning method greatly improves the enthusiasm of students in the classroom. Students are willing to participate in the classroom, become masters of the classroom, and improve learning satisfaction. Through a questionnaire survey of students, it was found that the questioning method is popular and loved by students.

Based on the results of this study, using the questioning method, the students' grades have been improved, their satisfaction has been increased, and the teaching effect has been improved significantly. A study found that after implementing the questioning method, the average post-test scores of participants increased by more than 20%, compared to the previous pre-test scores. This indicates that the questioning method can effectively improve learners' academic achievement and achievements. Research has shown that the questioning method has significant effects in improving academic achievement and learning outcomes for students. This personalized learning approach can provide customized learning paths and resources based on the characteristics and needs of learners, thereby better meeting their learning needs and improving their academic achievements and learning motivation.

Conclusion

By comparing and analyzing the pre - and post-test results of the "questioning method" intervention in the Management Science course of students from 1 class of the first year in the Faculty of Business Administration, the impact of the questioning method on students is obtained. The conclusion is as follows:

1) Students from 1 class of the first year in the Faculty of Business Administration used the "Questioning Method" in the course "Management Science Course" to take the pre-test of critical thinking ability. The average pre-test score of students' critical thinking ability was 16.97 (S.D=4.12), and the average post-test score of students' critical thinking ability was 22.60 (S.D=4.26) The statistical significance level is 0.05 (t29 = 34.67, p=0.01 < .05).

2) After adopting the "questioning method", the critical thinking ability of students from 1 class of the first year in the Faculty of Business Administration in management science courses was higher

than the 70% standard, with a statistical significance of 0.05(M=22.60, S.D=4.26, t29=2.06, p=0.000< .05).

3) The overall results of the questioning method by students are at a high level with (M=4.59, S.D=0.54). Thus, it was concluded that students' satisfaction of the students after receiving the questioning method was high.

Therefore, the questioning method is feasible for teaching in management science courses, which helps to improve the learning effectiveness and critical thinking ability of students. The experimental results validated the research hypothesis.

This study uses mathematical analysis software to evaluate the satisfaction of questioning methods in teaching. The results showed that students had the highest satisfaction with the questioning method. In the teaching process using the questioning method, students' personalized learning needs are met, students' interest in learning is stimulated, learning efficiency is improved, students' enthusiasm for participating in learning is improved, and it is conducive to improving students' critical thinking ability and winning students love it.
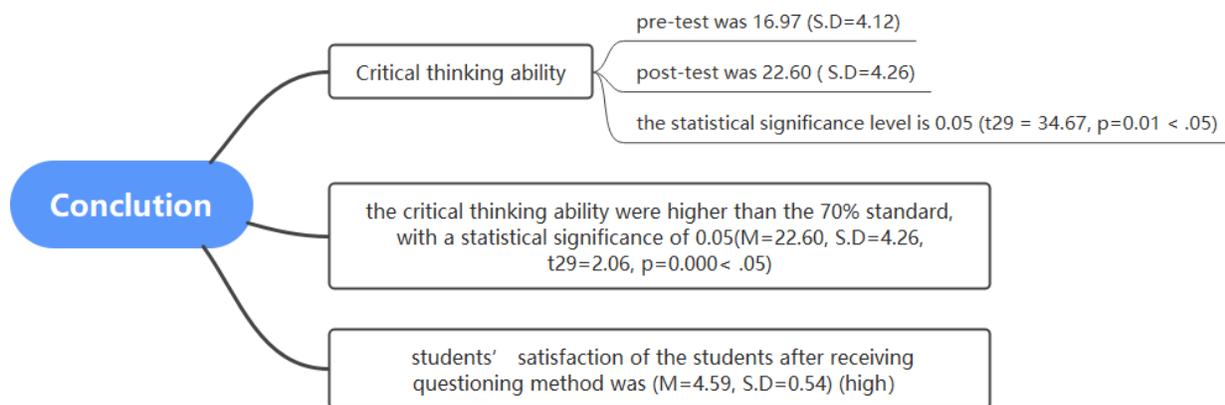

Figure 2 Conclusion

Recommendation
    1. Recommendation for implication

As an effective teaching strategy, the questioning method can significantly improve students' academic performance. Here are some specific suggestions for improving student achievement based on the questioning method:

    1.1 Carefully designed questions: Teachers should carefully design challenging and inspiring questions according to the teaching objectives and the actual level of students. The questions should be hierarchical, which can not only satisfy the consolidation of basic knowledge but also stimulate students' deep thinking.

    1.2 Diversified questioning methods: In combination with the course content, open, inquiry, closed and other questioning methods are adopted to stimulate students' learning interest and initiative. Encourage students to ask questions, and cultivate students' problem awareness and independent learning ability.

    1.3 Pay attention to individual differences: according to students' learning abilities and interests, implement personalized questions to meet the learning needs of different students. For students with learning difficulties, more attention and help should be given to stimulate their learning motivation by asking questions.

1.4 Provide thinking time: After asking questions, give students enough time to think and discuss, to cultivate their independent thinking and problem-solving ability. Teachers can use this time to conduct inspections and understand the thinking of students to give targeted guidance.

1.5 Positive feedback and encouragement: For students' answers, teachers should give timely and positive feedback to affirm students' efforts and progress. Students are encouraged to think from multiple angles and develop their innovative awareness and critical thinking.

1.6 Make use of study groups: Set up study groups, let students discuss and communicate in the group, and deepen their understanding and mastery of knowledge through mutual questions and answers. Teachers can participate in group discussions to guide students to think deeply and improve learning results.

2. Recommendation for further research

As an important teaching method in the field of education, the questioning method has been widely recognized for its role in promoting students' learning ability. However, with the renewal of educational ideas and the advancement of teaching technology, the research and practice of questioning methods are also facing new challenges and opportunities. The following are the prospects for future research on the question method:

2.1 The deepening of theoretical research

Multidisciplinary theory integration: Future research may further explore the integration of psychology, pedagogy, sociology, and other multidisciplinary theories into the study of the questioning method, to more comprehensively reveal the influence mechanism of the questioning method on students' cognitive, emotional, and social ability.

Innovation of research paradigm: Adopt more advanced research paradigms, such as mixed method research, action research, etc., combined with quantitative and qualitative research methods, to explore the practical effects and influencing factors of the questioning method more deeply.

2.2 The expansion of practical application

Personalized teaching strategies: Based on big data and artificial intelligence technology, develop an intelligent teaching system that can customize the questioning method according to the individual differences and learning styles of students, to realize the accurate implementation of personalized teaching strategies.Optimization of the online learning environment: With the rise of online education, research on how to effectively use question methods in online learning environments to improve student participation and learning effect has become an important direction of future research.

2.3. The improvement of the evaluation system

Diversified evaluation indicators: In addition to the traditional academic performance evaluation, future research can introduce more diversified evaluation indicators, such as students' thinking ability, critical thinking ability, innovation ability, etc., to evaluate the teaching effect of the questioning method more comprehensively.Combining process evaluation with summative evaluation: focusing on the performance and development of students in the learning process, combining process evaluation and summative evaluation, more accurately evaluates the role of the questioning method in promoting students' learning ability.

2.4. Emphasis on teacher training and development

Improve teachers' questioning skills: strengthen the training of teachers' questioning skills, improve teachers' ability to design questions and guide students' thinking, and make the questioning method play a greater role in classroom teaching. Training research-oriented teachers: Encourage teachers to participate in the research and practice of questioning methods, train research-oriented teachers, and promote the development and innovation of questioning methods in the field of education.

2.5. Strengthening international cooperation and exchanges

International comparative research: Through international comparative research, the experiences and results of different countries and regions in the research and practice of questioning

methods are understood, which provides reference and enlightenment for the research and practice of questioning methods of our country.International exchanges and cooperation: Strengthen exchanges and cooperation with international educational organizations and experts, and jointly promote the research and development of the question method on a global scale.

To sum up, the future research prospects of the questioning method include the deepening of theoretical research, the expansion of practical application, the improvement of the evaluation system, the emphasis on teacher training and development, and the strengthening of international cooperation and exchange. Through these efforts, we can better play the positive role of questioning method in the field of education, and make greater contributions to training talents with innovative spirit and practical ability.

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