TEACHING AND STUDYING BY ONLINE LESSON WITH CASE STUDY APPROACH FOR ENHANCE SOLVING-PROBLEM SKILL OF STUDENTS AT CHONGQING COLLEGE OF INTERNATIONAL BUSINESS AND ECONOMIC, CHINA

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ABSTRACT
This research aim to compare the solving-problem skill score before and after studying on online lesson of case study approach for students at Chongqing College of International Business and Economic, China. The population consisted of 80 of the first-year students of at Chongqing College of International Business and Economic, China. The samples were 66 students selected by sample random sampling. The research instrument were 1) online learning plan, 2) online lesson, 3) solving -problem skill online test, and 4) the satisfaction questionnaire. The study was statistic calculated by percentage, mean, and standard deviation. The result of the study were 1) The score of solving-problem skill of the sample after online lesson is higher than before the online lesson statistic significantly at .01.
Keywords: Teaching and Studying, Online Lesson, Enhance Solving-Problem Skills, Chongqing College of International Business and Economic

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INTRODUCTION

The In order to develop people and develop teachers into people with the ability to think. But from being a teacher, students who have studied in the teaching profession for more than 10 years have found that students' ability to think and solve problems has decreased to very little, which can be observed from the work assigned to students, both individually and in groups, such as when there was a problem from work. Students will not solve problems on their own or discuss them in groups and solve them. That's correct, but I'll keep that problem and wait to see the instructor to help solve the problem or go ask for help from other instructors who are not teaching the course. Even though the problem is a problem that can be easily solved, according to example problems, such as when the instructor assigns students to search for additional information on the current topic study, and students cannot find documents. Tables related to the subject you want to study can be found in the library. Students will stop searching immediately and wait to see the instructor to inform him that there are no books in the library, which shows that students cannot solve such simple problems without books. In the library, the information you want to search for may can be found from other search sources such as the Internet, Kannika Saechai, and corresponds to Daranpop Phianjad (2008) said that organizing learning using case studies is learning that presents media stories of various situations that have occurred or created by teachers to apply to various situations, causing students to be enthusiastic and learn quickly. Improved, have more thinking skills, and be able to analyze and synthesize knowledge to apply to solving various problems that arise. The learning is in the form of expression through lectures or small group discussions, emphasizing work skills. It's a team, which is organized using case studies. It is learning by studying case problems. Learners will receive present a real-life problem situation, and the learner must proceed to solve that problem. Solve problems. Learners will choose to deal with various principles. Studying on a case-by-case basis is appropriate for learning. Solve problems that do not have a single correct answer, especially if the problem is complex and can be viewed in many ways. Perspective: A case study can develop decision-making skills by considering solutions and presenting solutions this must be a case study written specifically to study and find solutions and there must be a written response. Smith and Ragan (2009), Ward (1998) stated that learners are able to present realistic problems in situations according to their goals and the purpose of the lesson is for students to understand problems from case studies and find reliable information refer logically, be able to solve problems from information in case studies, and develop critical thinking skills and case studies can be used as an effective learning strategy through the network, which currently technology computers and the internet have developed rapidly. Due to this strong trend, many countries around the world have taken different steps. Entering the age where information technology is used to develop various activities in the country today internet network Especially the WWW (World Wide Web) service has become an important tool in changing the format of teaching, training, and knowledge transfer counted as an increase. There are more communication channels between teachers and students. Thailand has introduced computers into tools for creating teaching materials have been around for quite some time. Starting with using the computer as teaching tools Computer subject Later, the development of teaching materials called Computer-assisted instruction media, or CAI (Computer-Assisted Instruction), Currently, many educational institutions have turned to use the internet network Called by many different names, such as WBI (Web-Based Instruction), WBL (Web-Based Learning) or WBT (Web-Based Training), etc., which is a teaching and learning system to receive information and knowledge content between students and teachers via the Internet, which has been developed.

The format has been improved to be a teaching medium in the form of e-learning (Electronics Learning) as a format online teaching is becoming highly popular in many other countries. Teaching and learning in the e-learning format has obvious outstanding features, such as

flexibility. Teachers can quickly update information at any time and create convenience for students who can study without time and place limitations, especially nowadays when it is easier to access the internet network and Internet connection costs are reduced. It also saves time and money on travel expenses because of the students you can study using a computer anywhere without the need to go to an educational institution or workplace, and importantly can immediately evaluate whether the learner has knowledge, understanding, and can practice or not. The quality of learning. E-learning teaching depends on the ability to create courses or content that must be effective. The sequence of steps is easy to understand, allowing students to learn by themselves without having to think about relying on the teacher. Students must read and practice the textbooks completely as planned. There is a test to measure understanding step-by-step until Ensure that learners understand the content completely according to the curriculum, and the most important thing is that there must be communication 2 ways between teachers and students from the foregoing, it can be seen that in managing learning in the 21st century, there must be development. Learners can think and solve problems while using modern online media using case studies or situations. Problems that are real situations and close to real life Allow students to solve problems and provide guidance. In solving problems and applying them to students' daily lives, the researcher therefore sees the importance of developing management. Learn about teaching and learning development in online lessons using case-study learning techniques promote problem-solving thinking among teacher students.

Research objectives

1) To compare the problem-solving scores before and after studying of students who online with learning techniques and case studies.

2) To study the satisfaction of students who studying online lessons using the learning technique case studies.

LITERATURE REVIEWS

Using online lessons is different from using printed lessons such as books and cards. Words, brochures, or other printed media because it is a lesson prepared using computer technology educational technology and internet technology Mixed together as mentioned above. Therefore, in the part designing online lessons must include several design elements, including: Teaching with online lessons teaching format with online lessons Essential components of a lesson on the advantages and limitations of using online lessons until the principles of designing online lessons are discussed.

Characteristics of teaching with online lessons teaching with online lessons can It can be done in many ways. Each institution and each curriculum content there will be a method for organizing teaching and learning, which are different in this regard according to the concept of Parson (1997), which has divided the characteristics of teaching and learning divided into 3 characteristics:

1) Stand-alone courses are courses that have tools and the most accessible and approachable source is the Internet. If there is no communication, you can go. Through the computer communication system (computer-mediated communication, or CMC), the nature of learning. This type of teaching is campus-style. There are many students who actually come to use it, but information will be sent from distance course.

2) Web-supported courses are courses that have characteristics. It is concrete in that there is a meeting between the teacher and the students, and there is a set of tasks to be done in the lesson. Assignment to read communication via the internet network or having a document page that can point to the location of the source in your area the website includes various activities.

3) Educational center teaching (web pedagogical resources) is a type of lesson that has raw materials and tools that can bring large subjects together or be a source of support for academic

activities. Action education, which those who come to use will have many media formats such as text, still images, animation, and communication between individuals, etc.

There are case studies used in organizing teaching and learning at both the basic education level and the tertiary level. There are many types, as scholars have proposed as follows:

Reynolds (1980, cited in Nittaya sorikul, 2004) has divided case studies into nine types, as follows:

1) The background case is a case study written in order to provide true news and information to students in specific situations that the author desires, where students will be able to receive various information related to real-life situations that can be easily used. This background case is suitable for students who have experience working (senior learners).

2) The Exercise Case is a case study similar to the first case but focuses on giving students practice. Techniques from case examples written from real situations rather than academic exercises.

3) The Situation Case is a case study written so that students can face the situation or an event that occurs as the student desires, whether it is an event of success or failure.

4) The complex case is a type of situational case, but the events and information written in such cases, there is more complexity, and the information provided is superficial and appears to be nonexistent. They are interrelated and may cause students to be distracted even though the data actually have relationships either way.

5) The Decision Case This type of case study is different from the ones mentioned above. In this case study, students will have to practice analyzing various events or situations from the data. Set example cases and practice deciding what to do in that situation and then writing it up as an action plan (Action Plan).

6) The in-tray case is a case study written based on the documents that come into the basket or grid of the case study writer. This case study will provide information to students, and students will be limited in time. Study in order to decide on actions in each assigned matter.

7) The Critical Incident Case: In this type of case study, students will get information about the situation that occurred. It is an item that is incomplete. Other information will be provided only when the student asks additional questions until the additional information is provided. Satisfactory for students' understanding of solving the sample case problem. This critical incident case is suitable for training students to develop skills in asking the correct questions.

8) The sequential case the technique for using this type of case study is to stop the story or situation. Critical point of the case study and have students predict the outcome of that event while stopping the matter. Next, let the students know the story, and then analyze and compare the results of the predictions or predict in advance the actual practice of the case study.

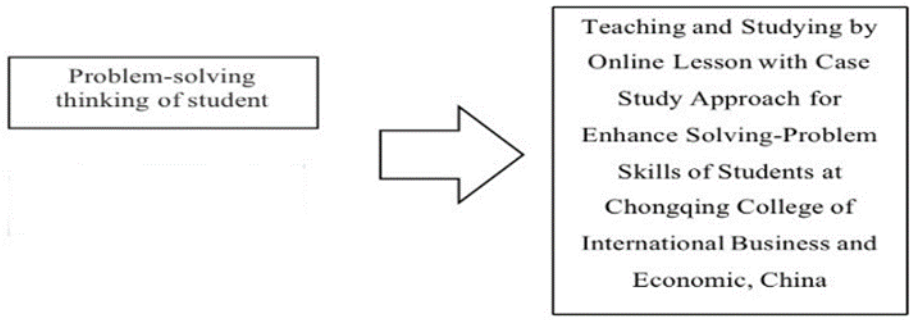

Figure 1 Conceptual Framework

RESEARCH METHODOLOGY

The population and Sample Group

Population used in this research are students at Chongqing College of International Business and Economic, China, Year 1, has 2 rooms, 47 people. Sample group used in this research are students at Chongqing College of International Business and Economic, China, 23 people, which were obtained from simple random sampling (Sample Random Sampling)

Research Instruments

A learning management plan for online promote problem-solving by student teachers Online lessons use case-study learning techniques to promote problem-solving thinking student teacher.

Test to measure the problem-solving thinking of students studying online lessons using techniques.

Learn through case studies to promote problem-solving. Satisfaction questionnaire of student teachers who study online lessons using the technique learn through case studies to promote problem-solving.

Data Collection

Study the bachelor's degree program in subject 1035101. Formal principles and concepts. Primary education, Lay out the story and analyze the course content to arrange it in order. The contents are separated as follows:

Chapter 1: Concepts of Primary Education
Chapter 2: The Evolution of Thai Primary Education
Chapter 3 of the National Education Act
Chapter 4: Basic Education Core Curriculum
Chapter 5: Teaching concepts and methods appropriate at the primary level
Chapter 6: Roles and duties of primary school teachers
Chapter 7: Teacher Personal Development

Data Analysis

Take the data obtained from the questionnaire and analyze it by finding the standard deviation. (Standard Deviation) and percentage (mean).

RESEARCH RESULTS

Results of the comparative analysis of the mean problem-solving scores before and after studying for students studied in online lessons using case study learning techniques, overall (N = 23).

Table 1 Comparing the average problem-solving scores before studying and after studying

Score	Full score	$\overline{X}$	SD	Df	t	Sig
Before Studying	30	14.45	2.03	35	17.431*	.000
After studying	30	23.18	1.75			

* Statistically significant at the .01 level.

From Table 1 comparing the average problem-solving scores before studying and after studying, the data provided offers insights into the effectiveness of online lessons using case study learning techniques for enhancing students' problem-solving abilities. The results highlight significant improvements in problem-solving scores, which call for a more detailed exploration of the underlying factors contributing to this outcome.

1) Before vs. After Scores Comparison:

Pre-study mean score: 14.45 with a standard deviation of 2.03, indicating that, before studying, students demonstrated a relatively lower problem-solving proficiency.

Post-study mean score: 23.18 with a standard deviation of 1.75, indicating that after studying, students showed a marked improvement in their problem-solving abilities.
The increase from a mean of 14.45 to 23.18 suggests a substantial mean difference of 8.73 points. This dramatic improvement is indicative of the positive impact that the case study learning method had on the students' cognitive abilities, particularly in applying knowledge to real-world problem-solving scenarios.
2) t-value Analysis:
The t-value of 17.431 represents a very large t-statistic, which is crucial in determining whether the difference between the pre-test and post-test scores is statistically significant. Typically, a t-value larger than 2.00 already suggests statistical significance, but a t-value as large as 17.431 indicates an exceptionally strong difference between the two conditions (before and after studying).
Such a high t-value shows that the probability of the improvement in problem-solving scores occurring by random chance is extremely low. The difference is unlikely to be the result of random variation, but rather a direct consequence of the case study-based learning intervention.
3) P-value (Significance Level) Analysis:
The p-value of 0.000 ($p < 0.01$) confirms that the results are statistically significant at the 1% level. This means that there is less than a 1% chance that the observed difference in scores occurred by chance, affirming that the improvement is highly significant. This level of significance reinforces the efficacy of the case study learning technique in enhancing students' problem-solving skills.
4) Impact of Standard Deviation:
Pre-study standard deviation (SD): 2.03
Post-study standard deviation (SD): 1.75
The relatively narrow standard deviations for both pre-test and post-test scores suggest that the students' performance scores did not vary widely within each group (before and after the study). The decrease in the standard deviation from 2.03 to 1.75 after studying indicates that students' post-test scores were more concentrated around the mean (i.e., the performance of most students improved consistently). This consistency implies that the case study learning approach had a uniform positive effect across the student population, benefiting most students equally rather than only a select few.
5) Case Study Learning Techniques and Cognitive Impact:
The results suggest that case study learning techniques were particularly effective in boosting cognitive abilities, especially those associated with problem-solving. Case studies typically involve the application of theoretical knowledge to real-world problems, requiring students to engage in:
Critical thinking
Analytical reasoning
Decision-making
Synthesis of information
The significant improvement in scores post-study reflects that students were likely better equipped to analyze complex situations, identify key problems, and apply relevant solutions—all of which are skills typically nurtured through case study learning. The improvement in problem-solving ability could also be attributed to the interactive nature of case studies, where students may have been required to work collaboratively or explore various perspectives on a given problem.
6) Pedagogical Implications:
The success of the case study method in this context has broader implications for pedagogical strategies:

Active learning: The case study method inherently promotes active engagement with the learning material, as opposed to passive listening. This deep engagement likely contributed to the students' enhanced ability to problem-solve.
Practical application: By focusing on real-world scenarios, case studies bridge the gap between theoretical knowledge and its practical use. The improvement in scores suggests that students not only understood the material but also learned how to apply it effectively in different contexts.
Collaborative learning: If the case study technique included group work or peer collaboration, this might have further enhanced students' learning by allowing them to learn from one another, clarify their thinking, and explore diverse approaches to problem-solving.
7) Potential for Broader Application:
Given the success of the case study learning approach in this study, it is worth considering how this method can be applied more broadly across various subjects. The fact that students' problem-solving abilities improved so dramatically suggests that case study learning can be an effective instructional method in other disciplines that require critical thinking, real-world application, and decision-making skills. This method might also be effective in subjects such as business, law, engineering, and medicine, where applying knowledge to complex, real-life problems is key.
The deep analysis of the comparative results clearly demonstrates that online lessons using case study learning techniques significantly improved students' problem-solving abilities. The substantial improvement in mean scores, coupled with the high t-value and statistically significant p-value, confirms the effectiveness of this teaching approach. The reduction in standard deviation suggests consistent learning outcomes across students, pointing to the broad applicability of case study learning techniques.
The study supports the idea that case study learning promotes active, critical thinking and practical application of knowledge, making it a valuable tool in enhancing cognitive abilities, particularly in problem-solving. The results further suggest that this method could be beneficial in a wide range of academic disciplines, particularly those that emphasize real-world problem-solving and decision-making.

DISCUSSION & CONCLUSION

Discussion

The comparative results of the pre-study and post-study problem-solving scores, based on case study learning techniques in online lessons, indicate a significant improvement in students' cognitive abilities. The data reveal several important insights into the effectiveness of this teaching method:
Significant Improvement in Problem-Solving Skills: The increase in mean scores from 14.45 to 23.18, with a substantial mean difference of 8.73 points, demonstrates the positive impact of the case study learning method on students' problem-solving abilities. The significant improvement highlights the effectiveness of case studies in promoting analytical reasoning, decision-making, and the practical application of theoretical knowledge to solve real-world problems. This finding aligns with previous research suggesting that case-based learning fosters critical thinking and problem-solving competencies by requiring students to engage in complex, real-life scenarios.
High t-value and Statistical Significance: The t-value of 17.431 and p-value of 0.000 (< 0.01) further confirm the statistical significance of the improvement in problem-solving skills. The exceptionally high t-value suggests that the probability of this result occurring by chance is extremely low. The p-value below 0.01 reinforces that the case study teaching method was a major contributing factor to the observed improvement in students' cognitive abilities, especially in solving complex, ambiguous problems. This finding supports the hypothesis that

active learning methods, such as case studies, yield better learning outcomes than more passive learning approaches.

Impact of Standard Deviation: The reduction in standard deviation from 2.03 (pre-study) to 1.75 (post-study) indicates that students' scores were more consistent after engaging in the case study learning technique. This reduction suggests that the method not only improved overall performance but also led to more uniform learning outcomes across the student population. The uniform positive effect implies that the case study learning method benefited most students, regardless of their initial performance levels, by promoting a deeper and more comprehensive understanding of the subject matter.

Cognitive Impact of Case Study Learning: Case studies require students to apply critical thinking and analysis to practical situations. This method emphasizes the following key cognitive skills:

Problem Definition: Students are trained to clearly define problems, understand the scope of the issue, and recognize the key variables involved.

Data Gathering and Organization: Students must gather relevant information, assess the credibility of their sources, and structure the data in a way that supports the problem-solving process.

Hypothesis Formulation and Testing: Students are encouraged to formulate hypotheses and consider multiple potential solutions before arriving at a final conclusion.

Decision-Making and Reasoning: The case study method forces students to think critically about ambiguous or incomplete information, make informed decisions, and justify their conclusions.

The improved problem-solving scores reflect students' enhanced ability to approach problems systematically, evaluate information critically, and make reasoned decisions.

Broader Pedagogical Implications: The success of the case study method in improving problem-solving skills suggests that this active learning strategy could be applied to other fields that require critical thinking and practical application of knowledge. This method may be especially useful in disciplines such as business, law, engineering, and medicine, where students must frequently apply theoretical concepts to real-world situations. By promoting active engagement, collaborative learning, and peer interaction, the case study method can foster deeper learning and better prepare students for professional challenges.

Conclusion

The results of this study strongly support the use of online case study learning techniques in enhancing students' problem-solving abilities. The significant increase in scores, coupled with the high t-value and low p-value, demonstrates that this method is highly effective in fostering critical thinking and cognitive development. The reduction in standard deviation suggests that the benefits of this approach are uniformly distributed across the student population, highlighting its ability to engage learners at different levels of proficiency.

The findings have significant implications for educational practices, particularly in fields that emphasize real-world problem-solving and decision-making. By adopting case study learning techniques, educators can promote active learning, improve cognitive outcomes, and better prepare students for complex, real-life challenges. The study further suggests that case study-based learning could be expanded to other disciplines that require similar cognitive skills, making it a versatile and effective teaching strategy for a wide range of academic fields.

In conclusion, this research demonstrates that case study learning techniques significantly enhance students' cognitive abilities and problem-solving competencies, making it a valuable tool for improving educational outcomes across diverse academic settings.

REFERENCES

Bozalek, V., Ng'ambi, D., & Gachago, D. (2014). Transforming teaching with emerging technologies: Implications for higher education institutions. *South African Journal of Higher Education, 28*(2), 419-435.

Brown, P. C., Roediger, H. L., & McDaniel, M. A. (2014). *Make it stick: The science of successful learning*. Harvard University Press.

Carriger, M. S. (2015). Problem-based learning and management development: Empirical and theoretical considerations. *The International Journal of Management Education, 13*(3), 249-259.

Chi, M. T. H., & Wylie, R. (2014). The ICAP framework: Linking cognitive engagement to active learning outcomes. *Educational Psychologist, 49*(4), 219-243.

De Grave, W. S., Dolmans, D. H., & van der Vleuten, C. P. (2015). Student perspectives on critical thinking in problem-based learning. *Medical Education, 49*(6), 590-598.

Garrison, D. R., & Vaughan, N. D. (2017). *Blended learning in higher education: Framework, principles, and guidelines*. 2nd ed. Jossey-Bass.

Hmelo-Silver, C. E. (2019). Problem-based learning: What and how do students learn?. *Educational Psychology Review, 16*(3), 235-266.

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