

A STUDY OF ABILITY IN CRITICAL THINKING SKILLS USING PROBLEM-BASED LEARNING OF STUDENTS IN FACULTY OF EDUCATION, SUAN SUNANDHA RAJABHAT UNIVERSITY.

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ABSTRACT

The purpose of this research was to study the critical thinking skills of the first-year students at Suan Sunandha Rajabhat University, by using problem-based learning management and also to compare the ability of critical thinking skills of the first-year students at Suan Sunandha Rajabhat University before and after using problem-based learning management as a whole and as in each aspect. The sample group used in this research is all the first-year students who are studying in the Faculty of Education, majoring in Early Childhood Education and are enrolled in language courses and literacy for pre-school children in the academic year 2018, 75 students were selected specifically.

The content of this research is related to critical thinking skills and problem-based learning management. The tools used in the research are learning management plans and the ability of critical thinking skills assessment test which was conducted before and after the experimental. The data were analyzed by using means, average and standard deviation. The result of the research indicated that the Problem-based learning management can develop students' critical thinking skills, moreover students has higher critical thinking skills after implementing the problem-based learning management at an average score. Referred to the ability of critical thinking assessment test after the experiment, the results were higher than before the experiment with an average of 16.14 that considered at a high level. And the standard deviation was 1.33 which is higher than the pre-test score with a mean of 7.04 at a low level and the standard deviation equal to 1.09 respectively. And when considering each aspect, it was found that every aspect had the level of competency, critical thinking skills after the experiment higher than before the experiment at all levels in every aspect. In the aspect of the capability of judging the data, the results of post-test shown at the highest level. Furthermore, in the capability in defining the definition aspect, the results of post-test shown at the lowest level.

Keywords: Critical Thinking Skills, Problem-based learning management

INTRODUCTION

Learning management is an important component of educational management as it is the implementation of the curriculum to practices in order to achieve the objectives or learning outcomes. There are variety of learning management form, which can be applied to any form of alternative use, with regard to subject characteristics consistency, student characteristics and other elements. Therefore, the effective learning management should be learning activities that focused on student, that could be students-based learning or student-center learning that allow students to practice with their real ability, aptitude and their interests which enabling students to explore the information and find answers on their topics that there were interested in by themselves as well as, could create the knowledge by themselves. One

of the important goals of modern education is to create and establish the student's critical thinking skills, the ability to cull information correctly, the ability in decision-making based on rational thinking that could be beneficial to oneself and to the public.

The Faculty of Education has organized teaching and learning for students according to the Ministry of Education's announcement on undergraduate qualifications standards and has operated under the Rajabhat University Act. One of the main missions under the Rajabhat University Act is to strengthen the teaching profession and produce as well as develop teachers and educational personnel to meet the quality and standard in becoming a higher professional appropriately. Therefore, it has determined the desirable graduate characteristics. For example, the graduates must have the ability of seeking data, exploring information, researching, educating and monitoring the development of science also developing educational technology and are always committed to personal development as well as having skills in integrating interdisciplinary science to enhance sustainable development. As a result of implementing learning management in all courses, encouraging students' knowledgeable in principles, concepts and theories, that enhance the ability of students to integrate science with the real life as well as having intellectual skills, creativity skills etc. to achieve the productivity of student characteristics that are consistent with those goals and principles.

To implement learning management in order to create ideal students' characteristics according to the Early Childhood Program of the Faculty of Education, Suan Sunandha Rajabhat University as mentioned above, the learning program has offering in many formats in which the problem-based teaching and learning activities (PBL) is considered one of the formats that can develop learners, and training students to work collaboratively and communicate effectively which is the strategy that promotes lifelong learning habits (Barbara J. Duch, Susan E. Groh and Deborah E. Allen: 2011) [1] both in terms of knowledge creation as well as increasing academic achievement and the development of cognitive thinking skills process in a wide range. In particular, the development of thinking skills towards critical thinking skills, which is particularly important in an age where information is linked together quickly both the fact and mis-leading information, so it is absolutely necessary to consider the information carefully and rationally.

Problem-based learning management (Problem-Based Learning) is the process of training the students to think, analyze, synthesize, with the problem as a starting point and encourage students to be interested in learning and searching for additional knowledge resulting from their direct experience, as well as allowing students to practice and learn by themselves, looking for the cause and effect of the events, practice summarizing some of the facts, which resulting in self-wisdom and knowledgeable that enabling students to develop critical thinking which is thoughtful thinking from the credibility of the information in the way that they choose to do or not to do, to believe or not to believe, can identify issues or questions that are appropriate for the situation, can judge the reliability of the information, classify facts and comments also can summarize the data reasonably through their consideration carefully of what is right, what is wrong, what should be believed, what should be chosen, or what should be done, they can live in a society more effectively.

This is in line with Vijarn Panich (2012:28929) [2] that has been mentioned interestingly about the principles that promote and encourage students to develop learning skills for self-improvement throughout their lives, that, this principle requires learning where students jointly build and share their own knowledge such as critical thinking, which is a learning that is characterized as building and creating the knowledge as a team which consisting of small skills.

In this regard, people who know how to use critical thinking will be the one who can perform various tasks and activities to achieve their goals of high quality and any society in

which members know how to think critically, it will lead and affecting in peace and stability to the nation (Sudarat Yodmongkol: 2010) [3]. Therefore, the researcher is interested in studying the ability in critical thinking skills by using Problem-based learning to promote the ability of students to be more effective in learning and in accordance with the desirable characteristics of the graduates in education department curriculum of Faculty of Education that intended to develop the students to be those who have the ability to integrate knowledge and skills towards the quality of early childhood education and towards the awareness of the global change respectively.

OBJECTIVES

1. To study the competency and critical thinking skills of the first-year students in Faculty of Education, Suan Sunandha Rajabhat University by using problem-based learning management.
2. To compare the ability of critical thinking skills of the first-year students in Faculty of Education, Suan Sunandha Rajabhat University before and after using problem-based learning as a whole and on each aspect.

METHODOLOGY

Research Scope

The sample group used in this research is all the first-year students who are studying in the Faculty of Education, majoring in Early Childhood Education and are enrolled in language courses and literacy for pre-school children in the academic year 2018, 75 students were selected specifically.

Duration Period: October – December 2018

The variables used in the research are as follows:

Dependent variable is: problem-based learning management.

Independent variable is: Critical thinking skills

Research methodology

The researcher conducted the research with the following details:

Part 1: Research tools and the process of tools building

Part 2: Data collections

Part 3: Data analysis and statistics used

The research process can be detailed as follows

Part 1: Research tools and the process of tools building

1.1 The tools used in the research are learning management plans and the assessment test of the ability of critical thinking skills before and after the experiment.

1.2 The process of tools building steps: The researcher has created the tool according to the steps by studying the basic information of the instrument from research theories, related articles and determine the framework of the equipment as well as quality inspection as follows

1.2.1 Language management plan and literacy learning management plan that focuses on problem-based learning management

1) Study the theory, research and related articles.

2) Create a language and literacy management plan for preschool children that focuses on Problem-based learning management by bringing the problems about the language

usage of preschool children in listening, speaking, reading and writing, as a content or as an information for students to learn through 6 steps, as following; step 1, problem setting, step 2, understanding with problems, step 3, conduct research, step 4, synthesizing the knowledge, step 5, summary information and evaluate the answers and step 6. present and evaluate the work. This is to enable students to develop critical thinking skills.

3) Verify the learning management plan with 3 experts in order to check the accuracy of the tools that is covered the content referring to the objectives, then revise or apply according to the experts' advice

4) Implement the revised learning management plan to conduct research

1.2.2 The ability of critical thinking skills assessment form

1) Study the theory, research and related articles.

2) Building the test to measure the ability of critical thinking skills, based on the concept of Anis.

The researcher determined the content of the Language subject and the literacy learning for early childhood, as a multiple – choice with 4 types of answers, containing with a number of 20 multiple-choices. Total 20 points

The score between 17 - 20 means the ability of critical thinking is at the highest level

The score between 13 - 16 means the ability of critical thinking is at high level

The score between 9 - 12 means the ability of critical thinking is at medium level

The score between 5 - 8 means the ability of critical thinking is at low level

The score between 0 - 4 means the ability of critical thinking is at the lowest level

The average grade level based on each aspect such as literacy ability in defining literacy, ability in analyzing the data and the ability in linking and summarizing the information as well as ability in critical thinking skills; are as follows.

The average score between 4.50-5.00 means the ability in each aspect is at the highest level

The average score between 3.50-4.49 means the ability in each aspect is at high level

The average score between 2.50-3.49 means the ability in each aspect is at medium level

The average score between 1.50-2.49 means the ability in each aspect is at low level

The average score between 1.00-1.49 means the ability in each aspect is at the lowest level

3) Verify the tools with 3 experts in order to check the accuracy of the content (Content Validity) which the ICO is at 0.89

4) Adopt the revised critical thinking skills assessment test of competence, critical thinking skills and conduct the pre-test, post-test with the student accordingly.

Part 2: Data Collections

2.1 The experimental plan: This research is an experimental research. The researcher uses the single group pre-test – post-test design experiment model (Suwimol Tirakanan, 2008: 21).

Table 1
Trial plan

Pre – test	Treatment	Post – test
O ₁	X	O ₂
When O ₁	means Pre-test assessment	
X	means Problem-based learning management trail	
O ₂	means Post-test assessment	

2.2 Data collection methods: The researcher collected the research data as follows.

2.2.1 Performing a student pre-test by using the critical thinking skills assessment form.
 2.2.2 Conduct the teaching according to the language learning plan and literacy for early childhood that emphasizes problem-based learning management.

2.2.3 Perform post-test assessment by using the student post-test critical thinking skills assessment form, which is the same form as the student pre-test critical thinking skills assessment form.

2.2.4 When collecting data from the student critical thinking skills assessment form. The researcher then proceeded to analyze the results accordingly.

Part 3: Data analysis and statistics used

The researcher used the results from the student critical thinking skills assessment test to analyze with the software program and presenting the data analysis results in the following order:

1. Analyze the effectiveness of the content validity of the student critical thinking skills assessment test by using the IOC (Consistency Index formula) which obtaining an IOC at 0.89.
2. Analyze scores from the student critical thinking skills assessment test to compare data between pre-test and post-test and analyzing the data by using the single group pre-test – post-test Design experimental model, using Mean and Standard Deviation.

RESULTS

The pre-test and post-test analysis results from the student critical thinking skills assessment form, the researcher found that problem-based learning management can help students to develop critical thinking skills and students have the ability to develop critical thinking skills in all cases after using problem-based learning management, which presenting in 2 parts as following:

Part 1: The comparison of the pre-test and post-test average score of ability in critical thinking skills when implementing problem-based learning

Part 2: The comparison of the pre-test and post-test average score of ability in critical thinking skills when implementing problem-based learning in each aspect. Details are as follows:

Table 2
showing the comparison of the pre-test and post-test average score of the ability in critical thinking skills when implementing problem-based learning

Assessment	No. of Student	\bar{x}	level	S.D.
Total Score 20				
Pre-test	75	7.04	Low	1.33
Post-test	75	16.14	High	1.09

* Statistical significance at the level of .05

From Table 2, it was found that problem-based learning management can help students to increase their ability in critical thinking skills. The students had higher ability in critical thinking skills after implementing problem-based learning management, with the mean score of 16.14 which was at a high level and the standard deviation of 1.33, which was higher than pre-test which was at a low level of 7.04 at and the standard deviation of 1.09. It was significantly different at the level of .05.

Table 2

shows the comparison of the pre-test and post-test average score of the ability in critical thinking skills when implementing problem-based learning in each aspect.

N=75	Literacy Learning Skills		Decision Making Skills		Data Summerizing Skills	
	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test
Mean	2.08	4.13	2.49	4.24	2.16	4.16
Std. Deviation	1.90	1.98	1.74	1.59	2.12	1.68
Post-Test ability score level	High level		High level		High level	

From Table 2, the researcher found that the average scores on all aspects are higher and when considered according to each aspect from the post-test score of the ability in critical thinking skills was at a high level, which is higher than pre-test score which was at low level. The comparison of the pre-test and post-test average score of the ability in critical thinking skills, can be explained as following:

In terms of decision-making skills, the average score on post-test was at 4.24 a high level which is higher than pre-test score which an average was at 2.4. In terms of data summerizing skills, the average score on post-test was at 4.16 which was at high level, and that was higher than pre-test score which valued at low level of 2.16. In terms of literacy learning skills, the post-test average score was at high level at 4.13, which was higher than pre-test average score at low level of 2.08 respectively.

The research findings are as follows:

A study of ability in critical yinking skills by using Problem-Based Learning to the student in Faculty of Education, Suan Sunandha Rajabhat University, the researcher found that, problem-based learning management can help students to increase their ability in critical thinking skills. Moreover, when considered an ability in critical thinking skills when implementing problem-based learning in each aspect, the research found the post-test average score in every aspect has increased compared to pre-test average score. However, in terms of the ability in decision making skills, the post-test average score was at the highest level.

The problem-based learning management can develop students' ability in critical thinking skills, due to the problem-based learning management is a cooperative teaching method which the process starts from problems that arise through knowledge creation and learning from group work processes. The problem will be the beginning of the learning process and be as a catalytic for developing problem, solving skills, searching for information, analyzing, synthesizing to understand the mechanism of problems as well as, methods of problem solving together from both the instructor and the students until they both can find a reasonable answer.

This is in line with Lee's Watanabe-Crockett concept (2016) [4] who comments on problem solving that it is skills that is natural and can develop further with an appropriate participation in learning. It is a deep approach learning that leads the students in better understanding and remembering for a long-time which result in a truly learning.

The students have practiced in planning, working, and solving problems rationally from a given situation until the results of learning were satisfied. They can think and reflect on situations that are ambiguous, or in conflict to decide what should be believed or should not believe what should be done, what should not be done, and change the incorrect ideas correctly through analytical thinking, rational thinking after the experimental carefully. As a result, the post-test score on the ability of critical thinking skills assessment test has increased.

This is consistent with Michael Tomaszewski (2019) [5] who stated that people with critical thinking skills will be able to think systematically and logically to understand the relationship between thoughts and facts, in order to help decide which information should be believed or not believed, in order to modify incorrect ideas correctly through analytical thinking. However, the problem used in learning will result in student's perception of how importance of what they have learned, how important of the future work, which has resulted in increasing motivation and a better memorization of students (Rusada Pakhia, 2014: 37) [6] which resulting in a post-test higher score in the ability of critical thinking skills assessment test. This is in consistent with the research paper of Nawaphat Trakulphon and Nilmanipitak (2015: Abstract) [7] that has studied the development of critical thinking ability and knowledge acquisition skills of high school student in Mathayom suksa 5 by using problem-based learning activities together with group Investigation learning technique (Group Investigation).

The results of the research showed that students develop critical thinking abilities from problem-based learning activities, together with cooperative learning through group investigation techniques (Group Investigation). From the total students of 26 person, there were 20 students who passed the criteria, representing 76.92 of all students. The knowledge acquisition rate has increased at high level of ($\mu=4.20$, $\sigma =0.60$), which has passed the specified criteria at high level. It also corresponds to the research of Pinthipa Suebsaeng and Sutthiphong Bunpadung (2013) [8] who have studied the research on using learning activities with the ARCS model, in order to develop critical information searching skills of the students in English language department, the researcher found that critical information search skills of students after using learning activities with ARCS was higher than before using learning activities with ARCS with statistical significance at the level of 0.05. In line with the concept of (Richard Paul and Linda Elder, translated by Decha Boonkham: 2008) [9] that discusses those with critical thinking ability will have the characteristics of self-guidance, self-disciplinary and self-improvement ability. Critical thinking skills will help in communicating, and increasing the ability to solve problems effectively.

CONCLUSION AND FUTURE WORK

Problem-based learning management is one form of learning management that can encourage learners to develop their ability of critical thinking skills effectively. It is an active Learning that focuses on students' practicing, problem-solving management, decision making skills, understanding all the environment as well as conducting research studies, synthesizing the knowledge, summarizing and evaluate the answers evaluation as well as presenting their work. This practice has resulted in the development of students' ability in critical thinking skills, in selecting, deciding and summarizing information logically through careful consideration. Therefore, these skills affecting in their learning, working and daily life effectively, which is an essential skill for todays as well as in the 21st century.

RECOMMENDATIONS

General recommendations:

The instructor may mix the situation used in the experiment directly from the interest of the learner.

Suggestions for future research:

Teachers should conduct research by using other teaching methods or other teaching styles combined with technology, or media to encourage the students to develop their critical thinking skills

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