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The Development of Analytical Reading Skills and Problem-Solving Skills of First-Year Students on Problem Based Learning (Pbl)

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Abstract

The objectives of this research study were (1) to compare the analytical reading skills and problem-solving skills of first-year students, majoring in the Teaching Thai, before and after employing Problem Based Learning (PBL), (2) to study the students' opinions towards the learning activities with Problem Based Learning. The population in this research was the Forty-Four-First year 152 students in Teaching Thai, studying in the academic year 2022. The sample group in this research was the first year 54 students in Teaching Thai, studying in the academic year 2022. The participants were selected by means of the Purposive Sampling Method. The instruments utilized in this study were lesson plans for analytical reading and problem solving, analytical reading skills and problem-solving skills tests and questionnaires of students' opinions towards Problem Based Learning. The data were statistically analyzed employing the mean and standard deviation.

The results of the study reveal as follows:

1) the students' mean score and the standard deviation on analytical reading skills and problem-solving skills tests were $\bar{x}$ = 15.25 and *S.D.* = 0.50 respectively, and after the treatment with Problem Based Learning, the mean score and the standard deviation were $\bar{x}$ = 20.20 and S.D. = 0.55, indicating that the analytical reading skills and problem-solving skills significantly improved and the statistical level of 0.05, in accordance with the hypothesis set.
2) The overall students' opinion towards the instruction employed the Problem-Based Learning was at a high level ($\bar{x}$ = 4.35, S.D. = 0.70). As considered in each aspect, it was found that, in Learning Activities, the students' opinion was at the highest level of agreement ($\bar{x}$ = 4.49, S.D. = 0.60), followed by Teaching Media, the students' opinion was at the very agreeable level ($\bar{x}$ = 4.45, S.D. = 0.61), on the Measurement and Evaluation Aspect, the students' opinion was in a very agreeable level ($\bar{x}$ = 4.40, S.D. = 0.76), and in terms of Learning Environment Management ($\bar{x}$ = 4.35, S.D. = 0.74).

Keywords: Analytical reading skills; Problem-solving skills; Problem Based Learning

Introduction

Future Skills for 21st Century Learning Emphasizes lifelong learning. It includes learning to read, write, calculate, think critically, communicate, collaborate, and be creative. life and career skills These include 3R8C (Reading) skills, (W) Riting (Writing and Writing), (A) Rithmetics, and 8C (Critical thing and problem solving), Critical Thinking and Problem-Solving skills, Creativity and innovation. Creative and innovative thinking skills, Cross-cultural understanding Skills for understanding differences and thinking processes of each culture, Collaboration information and media literacy Skills in communication information and media literacy, Computing and IT literacy Skills in the use of computers and information technology, Career and learning skills Professional skills and Ability to learn and Compassion, benevolence, morality, empathy for others In this regard, the development of analytical reading skills and problem-solving skills of current students is in accordance with the requirements of the National Education Act, B.E. 2542, Section 24. Relevant must arrange content and activities in accordance with the interests and aptitudes of the learners. taking into account individual differences skill training, thinking process, management, facing situations and application of knowledge arrange for students to learn from real experiences Practicing to be able to think, to do, to love reading and to have a constant curiosity. (Ministry of Education, 2008), which is consistent with the Office of Academics and Education Standards (2015), states that reading must develop along with the mind. Because thinking is important for learning, therefore, reading skills that are essential in today's society are critical reading skills. It is a high-level reading skill that involves thinking, considering, and reasoning in order to correctly understand what is being read. Critical reading is reading to gather important information. know the facts know the reason behind what happened Understand the history of various events and use them as criteria for decision making and evaluation effectively (Ruereandee, 2009 & Munkham, 2007) and problem-solving skills. It is the most important foundation of all thinking. This affects life in today's society that requires thinking skills to solve problems that arise all the time. It is also a skill that can develop attitudes, ways of thinking, values, knowledge, understanding of various situations very well and with high flexibility. (Munkham, 2004) Problem solving is creative thinking to find relationships between things and lead to the invention of new methods that will bring enormous benefits. (John Dewey, 1950)

However, from the test of students, it was found that 70% of students are still unable to complete the exam in critical reading and problem solving. Especially the problem that gives the situation to find that unable to apply the thinking process to solve problems in those situations well, consistent with Niam Noi (2008) who summarized the problem of reading as the students had deficits in analytical reading. because the students could not separate the main idea and the general idea, incompletely summarizing the main ideas of the story incapable of expressing the author's purpose or analyzing and synthesizing what was read in addition, the researcher interviewed all faculty members of the Thai language teaching program. It was found that the main reason for students' lack of analytical reading and problem-solving skills came from the traditional teaching and learning where teachers only focused on practicing reading skills. And still lacking the development of innovation or new technology to use, causing students to read the question problems or analyze the exam and answer the questions clearly. Developing students' ability to read critically. Teachers must have teaching techniques. a variety of methods There are appropriate activities and teaching communications.

Therefore, in this research, the Problem Based Learning (PBL) teaching model was used as one of the most important teaching styles. Because in addition to being a teaching style that promotes learning by focusing on learners is important and give students the opportunity to learn through the work process Can also develop students' problem-solving skills in other words, teaching that is learner-centered. The learners will learn from the experience of solving problems from situations. brings knowledge of working with others and this way of communicating gives learners the opportunity to develop the skills they will need in the future, including critical thinking skills. Citation of data obtained from searching and learning from the group process. It also allows learners to create new knowledge by using real-world problems as a learning context (Learning Context) for students to develop critical thinking skills and problem-solving skills. as well as gaining knowledge according to science in their field of study at the same time Problem Based Learning (PBL) is therefore the result of a work process that relies mainly on understanding and solving problems. And it is a teaching technique that encourages learners to practice by themselves. As a result, learners practice skills in many forms of thinking, such as critical thinking, analytical thinking, and synthesis thinking. creativity, etc.

From such importance Therefore, the research team has developed analytical reading ability. and problem solving of students of the first-year Thai language teaching program, Faculty of Education. Mahamakut Buddhist University Lanna Campus using a problem-based learning management model in order to provide students with guidelines for analytical reading. and can use the knowledge gained to solve problems that may arise in the future.

Research Objectives

The development of analytical reading skills and problem-solving skills of first-year students on problem-based learning (PBL) by organizing learning activities based on problems The researcher defines the objectives as follows:

1. to compare the analytical reading skills and problem-solving skills of first-year students, majoring in the Teaching Thai, before and after employing Problem Based Learning (PBL)
2. to study the students' opinions towards the learning activities with Problem Based Learning.

Literature Review

In this research the researcher has studied and researched the relevant literature as follows:

1. Critical reading

Critical reading refers to advanced reading that requires a thought process to consider what is read rationally and to be able to separate facts from opinions. for analysis, criticism, interpretation and evaluation of the readings consistent with Smith (1963) and Spache and Spache (1969). Analytical reading is reading for searching for information. to separate opinions from facts to understand the author's aim Then be evaluated and interpreted to make a decision based on experience or reason. On the other hand, Heilman (1967) concluded that analytical reading Analytical reading is reading comprehension of words, parables from texts, in order to grasp the main idea and connect the parts and to infer what is not evident from the interpretation from the author's point of view as to what is the purpose. Therefore, analytical reading

Therefore, it is important to study at the higher education level. Because reading activities in higher education are not easy. This way of reading will make students read faster and increase reading efficiency. This is an essential learning skill (The University of Melbourne, 2010). Critical reading involves reading a subject carefully and considering the purpose of writing. Then analyze the content of the story into parts to consider the concept, meaning, importance and relationship of the content. Readers must use their minds to distinguish elements within that story in order to summarize concepts and values from what they read. (Long, 2012; Phetcharat & Thongbai, 2013) and Setthapong and other (2017) have studied the development of an instructional model. based on reading apprenticeship approach and semantic mapping strategy for enhancing analytical reading. It was found that; the score of analytical reading higher than before the experiment at .01 level of significance in all components. And Yotatip and Tanunchaibutra (2016) studied Subject: The Development of Grade 9 Students' Analytical Reading Scemmary Writing Ability Using PANORAMA Teaching Method Together with STAD Techniques. The results show that: the students made a mean achievement score of 24.40 or 81.33 % of the full marks on analytical reading ability.

2. Problem solving thinking

Problem-solving thinking means a way of thinking that requires knowledge. concept And existing experiences to apply to the current situation. in order to get answers and step-by-step troubleshooting Consistent with Bouner and other (1971) stated that problem solving is the ability to use previous experiences from both direct and indirect learning from memory, knowledge and understanding. and valuation in solving problems by bringing a new arrangement To achieve success in specific goals. (Guilford, 1967; Polya, 1975) Then McKeachie (1986) brought the Futuristic Problem-Solving Model to try to develop future problem-solving skills of students aged 8-18 years by giving Students write problem sentences related to the future. create a goal and purpose carry out the solution Analyzing and predicting possible events to solve problems, it was found that this method encouraged students to be more creative, in line with Chitrakorn (2017) who studied A develop of collaborative blended learning using Future Problem- Solving techniques. to promote creativity in graphic design on instructional media of pre-service teacher students, Silpakorn University found that after taking the collaborative blended learning using Future Problem-Solving techniques, the creativity scores between pretest and posttest of the students who had different creativity levels, evaluated from CTTT, were not significantly different at the .05 level. And Nuankratok and other (2017) studied the effects of learning management using problem-based learning with higher-order questions on learning achievement in science and problem-solving ability on food. and livelihood of 8th grade students. The research findings were showed that problem-solving ability of students after using problem-based learning with higher-order questions was higher than before learning and higher than 70 percent criteria with statistically significant at .05 level.

3. Problem-based learning management

Defined problem-based learning as both a curriculum and a process. The curriculum consists of carefully designed and selected problems. for students to seek knowledge on their own Critical thinking skills Solve problems efficiently know how to use strategies to solve problems and participate in teamwork in part of the process Modeled from a systematic problem-solving process. Students can then apply knowledge to solve problems in life and problems caused by occupation. which is learning from experience (Experiential learning) starting from gaining direct experience from the problem. Through the process of thinking and reflection (reflection) leads to knowledge and concepts. which will be applied in new situations later (Barrows HS, 2000) in line with Peter Schwartz (2001); Barrows & Tamblyn (1980). A work process aimed at understanding and finding solutions. The problem itself is the focal point

of the learning process and a further catalyst for the development of reasoning problem-solving skills. and searching for desired information to understand the mechanism of the problem Including solutions that arise from real life (Stepien & Gallagher, 1993) in line with Nuankratok and other (2017) studied the effects of learning management using problem-based learning with higher-order questions on learning achievement in science and problem-solving ability on food and livelihood of 8th grade students. The research findings were showed that learning achievement of students after using problem-based learning with higher-order questions was higher than before learning and higher than 70 percent criteria with statistically significant at .05 level. and Luenam (2016) a development of learning achievement and research skill by applying problem-based learning approach and action research for bachelor of Education students. Conclusions: a comparison of the research results showed that after teaching by applying the problem-based learning approach was higher than before teaching.

Methods of conducting research

Research subject **"**The development of analytical reading skills and problem-solving skills of first-year students on problem-based learning (PBL)" as experimental research and one group pretest-posttest design by researcher studied the concept and demonstrated the steps, which details of the research are as follows:

1. The population used in this research are students in the 1st - 3rd year of the Thai language teaching program Faculty of Education Mahamakut Buddhist University Lanna Campus 152 students studying in the first semester of the academic year 2022.
2. The sample group used in this research is a first-year student in the Thai language teaching program Faculty of Education Mahamakut Buddhist University Lanna Campus who are studying in the first semester of the academic year 2022, of 54 students, which were obtained by selecting a specific sample group.
3. The tools used in the experiment consisted of 1) a learning management plan. The subject of analytical reading and problem-solving thinking through problem-based learning activities 2) a test to measure the ability of critical reading and problem solving. It was used to test before learning management (Pre-test) and after learning management (Post-test), 30 items, multiple choice. 3) Questionnaire on opinions of first-year Thai language teaching students on learning activities. know by using the problem as the basis
4. The statistics used to analyze the data are mean $\bar{x}$ and standard deviation (S.D.).

Summary Of Research Results

Research subject **"**The development of analytical reading skills and problem-solving skills of first-year students on problem-based learning (PBL)" as experimental research and one group pretest-posttest design, results of the research were summarized in order as follows:

1. Analytical thinking skills and Problem-solving skills of first-year students in the Thai language teaching program by organizing using the problem as a base after school is higher than before significantly at the .05 level.
2. Opinions of first-year students in the Thai language teaching program towards the learning activities using problem-based at a high level.

Part 1 The comparison of analytical reading abilities and problem-solving skills of first-year Thai language teaching students before and after learning. by using the problem-based arrangement. The number of students 54 is shown in the table below.

Table 1. *Comparison of analytical reading abilities and problem-solving skills of first-year Thai language teaching students before and after learning. by managing learning by using the problem as a base*

experimental group	N	μ	$\bar{x}$	S.D.	t	p
Pre-test	54	30	15.25	0.50	-12.30	.000
Post-test	54	30	20.20	0.55	-20.20	

From Table 1, it was found that the analytical reading ability scores and problem-solving skills of the first-year Thai language teaching students were organized by problem-based. Before learning, the mean was 15.25, the standard deviation (S.D.) was 0.50, and after the learning activities, the mean was 20.20, and the standard deviation (S.D.) was 0.55, indicating that critical reading ability and reading skills Thinking about solving problems of first-year Thai language teaching students by using a problem-based arrangement Post-learning was higher than before at statistical significance at the 0.05 level, which was in line with the hypothesis of the research.

Part 2 Results of the study of opinions of first year students in the Thai Language Teaching Program on organizing learning activities using problem-based learning

Results of the study of opinions of first year students in the Thai language teaching program on organizing learning activities using problem-based learning. The number of students was 54, divided into 4 aspects: 1) Learning Atmosphere 2) Learning Activities 3) Media and Learning 4) Measurement and Evaluation by analyzing mean ($\bar{x}$) and opinion level as the following table

Table 2 *Results of the study of opinions of first-year students in Thai language teaching program on organizing learning activities using problem-based learning*

No.	Assessment Items	$\bar{x}$	S.D.	opinion level	No.
1	learning atmosphere	4.35	0.74	a lot	4
2	learning activities	4.49	0.60	the most	1
3	Media and learning	4.45	0.61	a lot	2
4	measurement and evaluation	4.40	0.76	a lot	3
	all inclusive	4.35	0.70	a lot	

From Table 2, it was found that the opinions of first-year students in the Thai language teaching program towards the organization of problem-based learning activities Overall, the level of opinions was at a very agreeable level ($\bar{x}$= 4.35, SD = 0.70). Students' opinions were at the highest level of agreement ($\bar{x}$ = 4.49, SD = 0.60), followed by media and learning, students' opinions were at the level of high agreement ($\bar{x}$ = 4.45, SD = 0.61) and measurement and evaluation The students' opinions were at the level of agreeing ($\bar{x}$ = 4.40, SD = 0.76). Learning atmosphere ($\bar{x}$ = 4.35, SD = 0.74)

Discuss The Results of The Research

1. Analytical thinking skills and problem-solving skills of first-year students in Thai Language Teaching Program by using the problem-based arrangement after school is higher than before Significantly at the .05 level because the problem-based learning activities were teaching and learning that focused on the learners. practice group work process with research, questioning and problem-based In which students will start by reading the principles of analytical thinking through text. and take part in answering questions. Summarizing what has

been read express feelings, analyze and evaluate Teachers must prepare thoughtful situations for students to practice thinking. and can make students be able to receive messages and send messages Practice presenting your own ideas in groups. and practice presenting in front of the class. The researcher organized learning activities in accordance with the following steps:

Step 1 Open Experience, It is the step where the teacher encourages the learners to learn. To create motivation in learning by using discussion, questioning, reviewing prior knowledge necessary for new knowledge. Inform learning objectives And teachers have prepared teaching materials such as text, news, pictures, music, video clips, animations. to arouse interest The content that the teacher prepares will lead to teaching and learning. for students to think critically

Step 2 Presents the situation. It is a stage where learners present challenging situations to open up new knowledge experiences. It is the step of creating the conditions for furthering the idea. which teachers must find suitable media By giving students the opportunity to Ask analytical questions and answer analytical questions. observe and evaluate the results of what you think Learners are given critical reading scenarios and questions from teachers. Which is linked from opening experiences from what has been found and predicting what the students think will let the teacher know Learners analyze wide angles or narrow angles. and give the learners time to get to the new situation.

Step 3 Brainstorming activities It is the stage where learners have read the information together, think, analyze, synthesize, evaluate, solve problems, and discuss within the group. in which students can fully discuss their own ideas from reading the given situation Each situation in the learning management plan is different, including reading the main content, analyzing reading for knowledge, analyzing and summarizing the reading process.

Step 4 Build a body of knowledge It is the stage where the learners come out and present the concept of the group. And listen to the ideas of other groups as well to compare the similarities and differences between groups. where everyone must participate within the group The teacher observes students' ideas. Learners are given situations and read to analyze, evaluate, interpret, using their own judgment. to summarize and answer the questions of the teacher and help friends in the group to understand each other Once understood, learners work together to deliver messages through writing and speaking. To present and listen to opinions from friends in their own group.

Step 5Reflection step It is the stage where the learners work together to summarize the knowledge gained from their studies. to reflect the knowledge gained and check for discrepancies in the data during the conclusion The teacher encourages the learners to write a summary of their knowledge. and help facilitate learning By reflecting on the ideas of learners from speaking reports in front of the class or presenting mind maps. The instructor then helps to summarize each group's ideas learned. and when the students listened to the teacher's opinions Learners jointly assess what they have learned today that What are the benefits of problem-based learning in each area? which the evaluation results through the opinion questionnaire.

This is consistent with Torp; & Sage (1998) discussing the characteristics of problem-based learning as follows: 1) Attract students' attention. as if they were in the situation of the real problem to achieve the goal of student learning in a direction related to coherence. 3) Create a learning atmosphere by teachers collecting students' ideas. and instruct students to ask questions. This is in line with the Ministry of Education's (2007) conclusion that problem-based

learning management It is a form of learning management that starts from problems. To solve problems or situations where the problem is the starting point of the learning process and is a catalyst for the development of learners in skills and problem-solving processes. Emphasis on learners to be able to learn by self-direction. On the other hand, Pewluang and Thasa (2021) stated that the use of knowledge and critical thinking skills to manage various situations, as well as linking people's thoughts. cause learning in the dimension of oneself and others It is self-discovery and can be applied to society and learning to work with others. Significantly at the 0.05 level in terms of thinking, analyzing, summarizing, including self-esteem, consistent with Garutaka (2015) who studied the actual and expected conditions of students towards teaching and learning. proactive in teaching methods getting students to reflect through discussions case study There was a questionnaire from an interview. It was found that the mean scores of the students' opinions towards the real situation in the overall proactive teaching at a high level The evaluation of learning behavior adjustment of learners to see the achievement found that Post-learning behavior was significantly higher in each week at the statistical significance level of 0.05.

2. The overall students' opinion towards the instruction employed the Problem-Based Learning: the overall students' opinion towards the instruction employed the Problem-Based Learning was at a high level ($\bar{x}$ = 4.35, S.D. = 0.70). As considered in each aspect, it was found that, in Learning Activities, the students' opinion was at the highest level of agreement ($\bar{x}$ = 4.49, S.D. = 0.60), followed by Teaching Media, the students' opinion was at the very agreeable level ($\bar{x}$ = 4.45, S.D. = 0.61), on the Measurement and Evaluation Aspect, the students' opinion was in a very agreeable level ($\bar{x}$ = 4.40, S.D. = 0.76), and in terms of Learning Environment Management ($\bar{x}$ = 4.35, S.D. = 0.74). May be because Organization of learning activities using problem-based learning It is a learning activity that focuses on students as a key to train students' problem-solving thinking processes. Learners play a role in learning. This is an active learning activity in line with Bonwell & Eison (1991) stating that active learning management emphasizes learners to do more than listening to lectures. Value available in students and Chitrakorn (2017) found that Students' satisfaction after taking the lessons were at a high level of satisfaction on the lessons ($\bar{x}$ = 4.18, S.D. = 0.50) and Phochen & Vanichwatanavorachai (2014) studied the development of mathematics problem-solving ability of ninth grade students taught by problem-based learning approach and found that the opinion of ninth grade students' towards the instruction with problem based solving approach were at a high agreement level. On the aspects of learning environment, learning activities and learning usefulness were perceived at a high agreement level respectively.

knowledge gained

subject research Development of critical reading skills and problem-solving skills of first-year undergraduate students who manage problem-based learning The researcher gained knowledge that can be applied in teaching and learning management. and affecting students' abilities in analytical reading skills and problem-solving skills. And the students' opinions toward the problem-based learning activities were at the high level. as the following model diagram

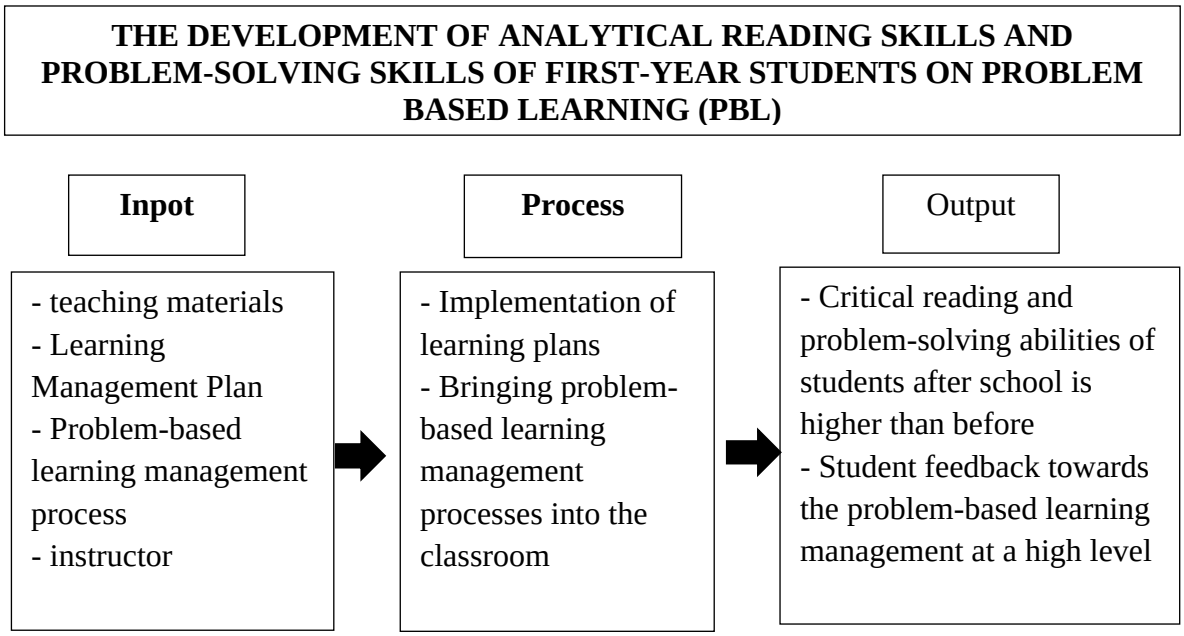

Figure 1 *Knowledge*

Feedback

1. Suggestions for applying the research results

1.1 Teachers should prepare a learning management plan that is thought-provoking. interest of learners and open learning experiences through the process of learning activities Start from step 1, open experience step Teachers should plan Search for a variety of creative teaching materials. Create issues that students are interested in to connect experiences and challenge ideas and lead to the main learning stage the important step of the problem-based learning activities is the stage of presenting the situation to the learners to read what the teacher chooses for the learners to read and synthesize various information.

1.2 Teachers should use questions that encourage students to use their judgment, assessed the situation and synthesize knowledge for further use in daily life.

2. General suggestions

2.1 The concept of problem-based learning should be used to organize activities for learning the various subjects of the Thai language learning subject group, namely the 4th main subject and the use of the Thai language, and the 5th substance, literature and literature.

2.2 Media innovations should be used in conjunction with learning activities. using the problem as a base, such as learning activities, skill exercises, program lessons finished lessons, etc.

References

Barrows HS. (2000). Problem-Based Learning Applied to Medical Education. Rev Ed. Southern Illinois.

Barrows, Haward S. and Tamblyn, Poblyn M. (1980). Problem –Based Learning: An Approach to Medical Education. New York: Springer Publishing Company.

Bouner,L.E, and other. (1971). The Phychology of thinking. New Jersey:Prentice–Hall.

Bonwell, C. C; Eison, J. A. (1991). Active Learning: Creative Excitement in the Classroom. ASHE-ERIC higher Education Reports. Washington, D.C.: The George Washington University.

Chitrakorn. C. (2017). A Development of Collaborative Blended Learning Using Future Problem Solving Techniques to Promote Creativity in Graphic Design on Instructional Media of Pre-service Teacher Students, Silpakorn University. Journal of Silpakorn University (Thai version). Vol.37(1)2017: pp. 23 – 42. [in Thai]

Dewey, John. (1950). How we Think. Lexington D.C.: Heath and Company.

Educational Standards. (2015). Critical Reading According to the Joint International Student Assessment (PISA) Guidelines. Bangkok: Agricultural Cooperative Association of Thailand Limited.

Garudaka. C. (2015). The reality and expected conditions of students towards proactive teaching and learning management. Bachelor of Arts Program Human Resources Development Ramkhamhaeng University Research funding of the Faculty of Human Resource Development. [in Thai]

Guilford, J.P. (1967). The Nature of Human Intelligence. NewYork. McGraw Hill.

Heilman, A. W. (1967). Principles and Practices of Teaching Reading. Ohio: A Bell and Hodell.

Long, M. (2012). The effects of explicit analytical reading skills instruction on the ability to solve mathematical problem in a written format in a third-grade classroom**.** USA.: University of Arkansas.

Luenam (2016) a development of learning achievement and research skill by applying problem-based learning approach and action research for bachelor of Education students. Ratchaphruek Journal. Vol.14 No.2 (May – August 2016). pp. 36 – 45. [in Thai]

McKeachie, W.J. (1986). Teaching and learning in the college classroom: A review of the research literature (Vol.86): University of Michigan Press.

Ministry of Education. (2008). Basic Education Core Curriculum 2008. Bangkok: Ministry of Education.

Munkham. C. (2004). Strategies for synthetic reading. 2th printing, Bangkok: prints.

Munkham. C. (2007). Strategies for Teaching Analytical Thinking**.** 4th printing, Bangkok: prints.

Niamnoi. C. (2008). The development of critical reading**.** Bangkok: Suree Wiyasan.

Nuankratok and other. (2017). The effects of learning management using problem-based learning with higher-order questions on learning achievement in science and problem-solving ability on food and livelihood of 8th grade students. Journal of Education Naresuan University. Vol.21 October – December 2019. Pp. 93 – 106. [in Thai]

Office of the Education Council Secretariat. (2007). Model of learning management to develop abilities of children in reading, thinking, analyzing, writing and creating their own knowledge by focusing on the students is important. Bangkok: The Secretariat of the Education Council.

Peter Schwartz, Mennin S, Webb G. (2001). Problem-Based Learning. Case Studies,Experience and Practice. Kogan Page Ltd,London.

Piwlhueng & Thasa. C. (2021). A model of learning management that emphasizes learning by action. Journal of Graduate MCU KhonKean Campus**.** Volume 8, Issue 4 October - December. Pp. 21 – 30. [in Thai]

Phakdeewirot. C. (2013). Results of proactive learning management the subject of mathematical process skills affecting the ability to solve mathematical problems, critical thinking, and self-confidence of Mathayom Suksa 3 students. Master's Degree Thesis**.** field of secondary education Srinakharinwirot University. [in Thai]

Phetcharat, J., & Thongbai, A. (2013). Thai language for communication. Bangkok: Odien Store.

Phochen and Vanichwatanavorachai. (2014). The development of mathematics problem-solving ability of ninth grade students taught by problem-based learning approach. Silpakorn Educational Research Journal**.** Vol.6 No.1 January – June 2014. Pp. 141 – 153. [in Thai]

Polya, G. (1975). How to solve it? A new Aspect of Mathematical Method. USA: Princeton University.Prentice–Hall, Inc.

Rueandee. C. (2009). Patterns and strategies of learning management for thinking development**.** Nakhon Pathom: Silpakorn University.

Satthapong and other. (2017). Development of an instructional model based on reading apprenticeship approach and semantic mapping strategy for enhancing analytical reading. Journal of Education Naresuan University. Vol.21 April – June 2019. Pp. 122 – 137. [in Thai]

Smith, Nila Banton. (1963). Be a Better Reader Book II. nd 2 ed. Englewood Cliffs, N,J.:Prentice–Hall, Inc.

Spache, G. D., & Spache, E. B. (1969). Reading in the Elementary School**.** Boston: Allyn and Buco.

Stepien, W., & Gallagher, S. (1993). Problem-based learning: As authentic as it gets. ducational leadership, 7(50), 25 - 28. [in Thai]

The University of Melbourne. (2010). Help sheet reading skills. Teaching and Learning Unit, Australia: University of Melbourne.

Yotatip and Prin Tanunchaibutra. (2016). The Development of Grade 9 Students' Analytical Reading Scemmary Writing Ability Using PANORAMA Teaching Method Together with STAD Techniques. Journal of Education Khon Kaen University (Graduate Studies Research). Vol.11(1) January – March 2016. Pp. 254 – 260. [in Thai]

Torp, Linda & Sage, Sara. (1998). Problem as Possibilities: Problem-Based Learning for K-12. Alexandria, Virgnia: Associationfor Supervision and Curriculum Development.