The Effects of Blended Learning Using Collaborative Learning with STAD Technique on MOODLE to Enhance Analytical Thinking for Grade VII Students

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***Abstract*—The objectives of this research were 1) to create Blended Learning Using Collaborative Learning with STAD Technique on MOODLE to Enhance Analytical Thinking for Grade 7 Students. 2) To compare the analytical thinking of the learners with the Blended learning and learner in the regular learning session. 3) To compare the achievement of learners with the Blended learning and the learner in the regular learning session. The samples used in this research were grade 7 students in Sichomphu Suksa School, Khon Kaen province, North East of Thailand, which enrolled in the first semester of academic year 2018. Consists of 32 experimental groups and 32 control groups who randomly assigned to the Simple Random Sampling. The research instruments were 1) the blended learning using collaborative learning with STAD Technique on MOODLE to enhance analytical thinking for grade 7 students had standard criteria efficiency 80.63/80.31. 2) A test of analytical thinking between before and after learning entitle "Computer Elements", and 3) a test of learning achievement entitle "Computer Elements". This research base on Randomized Pretest - Posttest Control Group Design. The statistics used in the data analysis were percentage, mean, standard deviation and the t-test independent. The research results were: 1) the blended learning using collaborative learning with STAD technique on MOODLE to enhance analytical thinking for grade 7 students had standard criteria efficiency 80.63/80.31, 2) the students who study the blended learning had the analytical thinking score higher than students who study in regular learning session, and there was statistically higher than at level .05. 3) The students who study the blended learning had the learning achievement score higher than students who studies in regular learning session, and there was statistically higher than at level .05.**

***Index Terms*—blended learning, STAD, analytical thinking, achievement, moodle**

I. Introduction

Today's technology is changing rapidly. People use technology and play a greater role in the world to expand the possibilities of using their intellectual and practical resources. Technology is more comprehensive than information and communication. Technology will include teaching areas in many countries that have expanded their capabilities in technology and have seen its true valuable. (A. Jones, B. Cowie, J. Moreland, 2010). Technology is the force of movement and industrial revolution. Technology helps increase value in the service sector as well as the current knowledge base. In order to provide education as a tool for economic development, society, culture and politics of the country to truly advance the world of society, news and information

The National Education Act, BE 2542 (1999) has established guidelines for the management of education that education must be developed in order to develop Thai people to be complete human bodies, minds, intellects, knowledge and morals, ethics and culture of life Can live happily with others and adhere to the principle that all learners are able to learn and develop themselves And considered the most important learner The educational management process must encourage learners to develop naturally and fully according to their potential. Section 9 discusses the use of technology for education. The state must promote and support production. And develop textbooks, academic books, other printed materials, and other educational technologies To develop personnel both in the production and the technology users to have knowledge and ability In production as well as effective use of technology Based on such guidelines, it is a push for teachers to develop themselves. Change teaching methods from instructors to provide advice, help, suggest strategies for seeking knowledge. And facilitate students to learn and seek knowledge by themselves Allow students to take

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action And create knowledge in the brain itself By means of Media and technology as well as learning resources (Ministry of Education, 1999)

Education Management in the 21st Century.The education system must be developed to be in line with current realities. To provide children and youth with learning and problem solving skills The skills that children need in the 21st century are 3R4C, including reading, writing, calculating, thinking, analyzing, communication, collaboration and creativity. Including life and career skills And is indispensable in information, media and technology skills Because the modern generation is a generation that likes to use the internet Therefore, information systems are important and easy to access and effective. Can expand and connect knowledge around the world Learning management in the 21st century, teachers have to adhere to the principles of teaching a little, learn more about children to learn by themselves. And learn from within their mind and brain By providing teachers to facilitate and design learning in learning (Wichan P., 2012)

Web-based teaching, also known as Web-Based Instruction, is a multi-dimensional teaching program. Using the World Wide Web features and resources in creating a meaningful learning environment that promotes and supports teaching (Khan, 1997). Therefore, effective learning management in accordance with the current situation the researcher adopted a blended learning method. Alternatively, Blended leaning is to use in teaching and learning. Blended leaning is the learning process that combines a variety of learning styles whether it is learning in the classroom or online classroom learning will focus on talking in the same way. For online learning, students will be able to write and respond online. Which is integration. (Garrison and Vaughan, 2008). In addition, learning management through blended learning methods, teachers can use teaching methods two or more ways in teaching. For example, the instructor presents the lesson content through technology, combined with face-to-face teaching. However, after that, the instructors brought the content to hang on the web. Then follow the activity of teaching and learning using e-learning. With LMS: Learning Management System with computers in the laboratory after that, summarize the lesson. With discussions with teachers in the classroom.

Another interesting teaching and learning management system is the Learning Management System (Moodle). This is a free software developed in open source (GPO) with copyright (GPL (General Public License) or free license users can download to install and use. Moodle is a highly capable learning system and can be applied to a variety of applications. It is a software that manages the teaching and learning through the web. Moodle will provide a tool to facilitate the instructors, learners and administrators by the instructors, bringing the content and teaching materials on the course website as requested by the system. There is conveniently provide students can access various activities through the World Wide Web. Instructors and students contact, communicate through communication tools provided by the system, such as electronic mail, chat rooms, question-and-answer boards, etc. In addition, there are also important elements that are to save data of learning activities of the learners on the system. So that the instructors can analyse Monitor and evaluate the results of teaching in that course effectively (Arnat, 2015)

II. Blended Learming

Blended learning, classroom and online learning. Researchers think that teaching management allows students to learn in a cooperative manner will help them to rely on each other. In seeking more knowledge, a cooperative learning is a teaching and learning process that divides students into small groups. Members of the group have different abilities, exchange ideas. Help to support each other and have shared responsibilities in both personal and public duties, so that the group can achieve success according to the set goals. Cooperative learning with STAD (Student Team-Achievement Division) Team-based learning that can apply to all subjects and levels. In teaching, teachers will divide students into groups. Each group consists of students with different abilities. Have both female and male and there are many races. The teacher must explain to the students in the group about the duties of the group members that the students must help each other, study together and discuss the problems together. Check the answers of the assigned tasks and edit the answers together. All members of the group must work their best to achieve learning. Encouraging and working together, each member of the group must help answer questions. To prepare for the subtest each member of the group must help answer all questions. In addition, when answering the questions, they will exchange their answers each member must have responsibility for each other in answering each question. To encourage each member to have a responsibility for each other (Slavin, 1995)

A. Benefits of Blended Teaching and Learning

Allen and Seaman discussed the classification of blended teaching and learning organized by the Sloan Consortium. By using the level of online communication as a part that determines the proportion of teaching and learning divided into 4 types

1) The traditional type is the teaching and learning in normal classes as lectures. Using boards or transparencies, etc. Without online teaching

2) Web Page type use online teaching methods 1-29 percent and still be a classroom teaching. By using the course management system as a web page that uses announcements for students in various subjects such as descriptions of homework courses.

3) Blend type using online teaching methods, 30 - 79 percent mixed between using online systems and traditional teaching in class. Most teaching materials are online.

4) Online types or e-learning use online teaching methods, up to 80 percent or more. Most or all of the teaching materials are in an online format. There may be

no face-to-face meetings, and there may be no classroom study.

B. Element of Blended Learning Management

1) Off Line type means technology, innovation and blended learning methods that are focused solely on the use of only one learner. Or no connection with other learners at that time. Which can be divided into 5 types as follows

- Workplace Learning or learning in the residence.
- Face-to-face tutoring: supplementary teaching, advice or counseling.
- Classroom Learning: Learning in normal classes, educational seminars in simulated scenarios, role-playing and evaluation, etc.
- Print media: including documents, books, journals, reports and articles Focused on single use.

2) Online type refers to technology, culture and methods used in mixed learning that are shared by many people. Both teachers, students, instructors And other related persons By connecting together through the internet network. Which is divided into 6 characteristics as follows

- Online Learning
- E-Tutoring
- Cooperative learning
- Online Knowledge Management
- World Wide Web
- Mobile Learning

The evolution of technology and computer networks today Make the world change in a better way. By applying technology to pass knowledge. And used as a way to communicate between people. Learning and teaching with E-Learning is well known for students. Able to achieve learning goals better than studying in traditional classes.

The main obstacle is availability of utilities and learners. Including the process of designing the media must be of quality and focus on learners so it will be successful. Therefore, online teaching and learning management has been integrated and in regular classes. Or called Blended learning. In order to supplement the good parts and compensate for the limitations of the media used. Blended learning is accepted both in training and teaching in educational institutions. With the flexibility to use media learning and in accordance with learning conditions in the learning community

III. Analytical Thinking

Analytical thinking is the ability to classify enumerate various elements of one thing or any and find a rational relationship between those elements. To find the exact cause of what happened when thinking analytically, like seeing the results of something and not immediately summarize what caused it, what does this mean? But trying to find the right facts first. What are the results that we see caused by the true cause? By assuming, that everything that happens is that there is a place to go. Would have reason and has a small element hidden inside, which may be consistent, or contrary to what appears outside. Therefore, understanding the real condition requires analysis in order to answer this question. Moreover, for what reason is so. Before we summarize or make assumptions about that matter, analytical thinking does help us understand the principles and use them to analyse almost every, any situation that occurs in life can read things. That has happened and penetrated help in daily life as well. Moreover, can apply the principles, concepts, methods used in performing duties, which will benefit themselves and the organization in the future. (Kriangsak C., 2006)

For this reason, the researcher is interested in studying about the development of lessons on the network and web-based teaching and learning with the module teaching and learning system. To study the learning outcomes by using a blended learning method using cooperative learning, which grouping achievement patterns on LMS-Moodle to enhance analytical thinking for grade 7 students in information technology and communication in Sichomphusueksa School, Si Chomphu District, Khon Kaen Province, Thailand. This research would be a guideline for developing a blended learning model for the maximum benefit of the learners in secondary school in the future.

IV. Objectives

A. To create Blended Learning Using Collaborative Learning with Student Team Achievement Divisions (STAD) Technique on Learning Management System (MOODLE) to Enhance Analytical Thinking for Grade 7 Students.

B. To compare the analytical thinking of the learners with the Blended learning and the learner in the regular learning session.

C. To compare the achievement of learners with the Blended learning and the learner in the regular learning session.

V. Methodology

A. Population and Sample

The population is grade 7 students at Sichomphu Suksa School, Si Chomphu District, Khon Kaen Province, enrolled in the first semester of the academic year 2018. We set the students into the experimental group and the control group. The experimental group was 32 students and the control group was 32 students. The experimental group and the control group were obtained from Simple Random Sampling.

B. Instruments

1) The tool in the experiment is Blended Learning Using Collaborative Learning with STAD Technique on MOODLE to Enhance Analytical Thinking for Grade 7 Students at URL: www.classitbl.com

2) The tool for data collection is the analytical thinking test of the learners. There are a multiple choice exam, 20

options and 20 items for the achievement test and a multiple choice test of 20 for the satisfaction assessment test. The assessment style is a Likert Scale of 5 levels.

C. Data Collection

Researchers created a blended lesson and studied the effects of blended learning using collaborative Learning with STAD technique on MOODLE to enhance analytical thinking for grade 7 students entitle "computer components" And applying the results to analyze the effectiveness of integrated lessons with steps and processes as follows:

1) Studying cooperative learning methods, group form, achievement is used as a guideline and a model for creating blended lessons to get the correct format according to principles and theories

2) Study of behavior theory at 6 levels of Benjamin Bloom (Bloom, 2001) and the theory of analytical thinking

3) Study courses, textbooks and documents related to the content of computer components. To be used as content in creating blended lesson lessons. Then, all the contents divided into 5 units of study.

4) Set behavioral objectives to be consistent with the content and create a test analysis table to show the importance of the content. Determine the amount of the exam as needed.

5) Create lessons blended learning by using the program LMS Moodle as Web page design and Using program Adobe Photoshop incoming image decoration.

6) Create a measure of Analytical thinking.

7) Quiz created and modified take it to experts.

8) Check out the performance efficiency of the lesson. One to One Testing, Small group testing and Field testing

9) Scores of practice all 5 unit and test score, after learning from the research sample groups of students came to the performance analysis of integrated lessons E1/E2 demonstrates that integrated lessons that build up effective and can be used as a teaching media to continue.

VI. Research Result

A. The Results of the Efficiency of Blended Learning

TABLE I. SHOW CALCULATING THE EFFICIENCY OF THE BLENDED LEARNING IN 3 STEPS

The experiments	No. of groups (Group) (member)	Total score: (100)	The score after each examination	The effectiveness of the Blended Learning E_1/E_2
One to One Testing	1(4)	259	85	58.86/53.13
Small Group Testing	2(8)	578	224	72.25/70.0
Field Testing	6(24)	1935	771	80.63/80.31

From Table 1 Shows that in one-to-one experiments, the efficiency value (E1 / E2) equal to 58.86 / 53.13. The small group study has the efficiency value (E1 / E2) equal to 72.25 / 70.0. The field experiment has the efficiency value (E1 / E2) equal to 80.63 / 80.31. A summary of the studies to find the effectiveness of the integrated lesson by cooperative learning. The achievement group pattern on the learning management system to promote analytical thinking for grade 7 students with efficiency (E1 / E2) equal to 80.63 / 80.31, which is in accordance with the set criteria 80/80 can use for teaching and learning about computer components that promotes analytical thinking for grade 1 students

B. The Results of the Comparing on Analytical Thinking

TABLE II. SHOWS A TABLE TO COMPARE THE ANALYTICAL THINKING OF THE LEARNERS WITH THE BLENDED LEARNING AND THE LEARNER IN THE REGULAR LEARNING SESSION

Experimental group.	The number of groups (people)	$\overline{X}$	S.D.	T	P
The learners with the Blended Learning.	32	16.38	1.81	3.967	.000*
The regular learning session.	32	14.63	1.72		

*$p<.05$, $df=62$

From Table II Found that the score to measure analytical thinking. The learners with Blended Learning has average score equal to 16.38, standard deviation equal to 1.81.The regular learning session has average score equal to 14.63, standard deviation equal to 1.72. T-test independent value equal to 3.967. Analytical thinking score of the learners with Blended Learning higher than the analytical thinking scores of students studying in the normal learning style at .05

C. The Results of the Comparing on Achievement

TABLE III. SHOWS A TABLE TO COMPARE THE ACHIEVEMENT OF THE LEARNERS WITH THE BLENDED LEARNING AND THE LEARNER IN THE REGULAR LEARNING SESSION

Experimental group.	The number of groups (people)	$\overline{X}$	S.D.	T	P
The learners with the blended Learning.	32	16.63	1.45	4.513	.000*
The regular learning session.	32	15.09	1.25		

*$p<.05$, $df=62$

Found that the score to measure achievement. The learners with Blended Learning has average score equal to 16.63, standard deviation equal to 1.45.The regular learning session has average score equal to 15.09,

standard deviation equal to 1.25. T-test independent value equal to 4.513. Achievement score of the learners with Blended Learning higher than the achievement scores of students studying in the normal learning style at .05

VII. Discussion

A. The result of the performance of the effects of Blended Learning using Collaborative Learning with STAD technique on MOODLE to enhance Analytical Thinking for grade 7 Students E1/E2 performance values are equal to the defined criteria is met, namely, 80/80.

B. The analytical thinking score of learners who learned by Blended Learning using Collaborative Learning with STAD technique on MOODLE to enhance Analytical Thinking for grade 7 Students higher than the learners. Studying in normal form with statistical significance at .05

C. The learning achievement score of learners who learned by Blended Learning using Collaborative Learning with STAD technique on MOODLE to enhance Analytical Thinking for grade 7 Students higher than the learners. Studying in normal form with statistical significance at .05

VIII. Suggestions

A. Suggestions form This Research

1) The creator of the lesson must first study the blended learning. In order to be able to use the program conveniently, understand and be able to apply the program to be consistent with the principles and theories that could applied to that content.

2) Researchers should study and prepare educational resources such as computers. Internet network system, etc., in order to ensure that education to conduct correctly and appropriately.

3) The suitability of blended learning depends on the student's computer skills. Therefore, blended teaching is good. Students should have computer skills at a level that is not a problem for learning.

B. Suggestions to Study Next Research

1) Create a blended learning, cooperative learning, and achievement based grouping model on a learning management system that promotes students' analytical thinking. For other grade students.

2) Integrated learning management, cooperative learning, achievement-based grouping pattern on the learning management system that promotes students' analytical thinking for teachers, educational personnel and those interested.

3) Integrated learning management, cooperative learning, achievement-based grouping pattern on the learning management system that promotes advanced thinking for grade 7 students.

4) Integrated learning management, cooperative learning with other techniques. That promotes analytical thinking for students

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