

Development of Science Learning Management Model to Inquiry Integration for Improving Achievement of Secondary Education in 12th Grade Students at Chumphaesuksa School, Thailand

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Abstract:- scientific knowledge is rational using. This research aimed to development of science learning management model to inquiry integration for improving achievement. The collection came from documentary, brainstorming with science teachers instructional and experts for developing and evaluating model, using a model to instructional for studying efficiency in accordance with the criteria 80/80, testing achievement, survey by questionnaire for studying satisfaction with secondary education in 12th grade students at Chumphaesuksa school, Thailand to the data. Science learning management model to inquiry integration including a importing lessons step, hypothesis step, experiments and surveys step, conclusion step, and promoting application step, and suitability of model at a level of high levels. Efficiency in using a model to instructional have to criteria efficiency in average percentage of 86.50/94.50. Students' achievement to higher scores after than before to statistically different at significance level of .01. Students' satisfaction at a level of high levels. In the finding will be presented and discussions.

Keywords: science learning management model, inquiry integration, improving achievement

I. INTRODUCTION

The modern world culture was Knowledge based society which all students need to be developed of scientific literacy for all have to knowledge, understanding in the natural world and technology include applying knowledge logically. By the knowledge of science not only used to improve the quality of life. Also, helps to have the right knowledge and understanding about balance utilization and most importantly, knowledge of science helps to increase capacity for development and linking knowledge with learning management processes for giving the students to

developed of creativity, analytical thinking, critical thinking, including result skills and knowledge components throughout the process of searching knowledge, able to solve problems systematically, able to make decisions using a variety of information and testimonies. [1] Foundation of science learning for the students to be connected seamlessly. Which the science learning curriculum of Thai's basic education to specify indicators and subject of learning That students need to learn for able to apply knowledge to life And use science to connect knowledge and learning processes, organizing learning activities that encourage students' to developed ideas include rational thinking, creativity, critical thinking, with scientific process skills and 21st century skills. [2] A past science teaching styles in which the teachers will determine or select of teaching style according to the recognized educators at that time, using beliefs concepts, or from teachers to study different teaching styles then synthesized and developed into a teaching model for learning management to the students of effectiveness. [3] One way to solve the problem is to use a learning management model that is good and suitable for real conditions of the students and according the requirements which will make the students have a good attitude towards science for effecting the students want to learn and to have science knowledge.

However, the development of science learning management model to inquiry integration for improving achievement of secondary education in 12th grade students at Chumphaesuksa school, Thailand there is learning management design, appropriate and environment conducive to learning of students' were stimulating responses to learners and have to diversity and is ready for learners to learn while they are interested in learning to efficiency and sustainability. Research objective have four mains to study were followed:

- Developing science learning management model to inquiry integration for improving achievement of secondary education in 12th grade students at Chumphaesuksa school, Thailand.
- Studying the efficiency of using an instructional in science learning management model to inquiry integration for improving achievement of secondary education in 12th grade students at Chumphaesuksa school, Thailand on according to specified criteria of 80/80.
- Studying science achievement of secondary education in 12th grade students at Chumphaesuksa school, Thailand.
- Studying satisfaction to instructional by science learning management model to inquiry integration for improving achievement of secondary education in 12th grade students at Chumphaesuksa school, Thailand.

II. REVIEW LITERATURE

➤ *Developing Science Instruction Model*

Abd- EI-Khalich, F. and N.G. Lederman [4] presented of teaching and learning elements which to system of interaction between learners and teachers, learners themselves and other environments. Learning is a process that occurs in students, and will be useful if students are able to accumulate what they have learned to use in new situations including the connection will improve when the things learned have a relationship with the new situation. teachers should use various methods to support and encourage learners to learn and accumulate what is learned to used.

➤ *Inquiry Learning Management*

Dreyfus, S. E. [5] learning management techniques that encourage students to search for answers to specific issues, emphasizes on the students to be responsible for their own learning. Also, the role of the teacher is to enlighten and facilitate That will help students for finding information and organize their own information, apply knowledge rationally from organizing content and activities in accordance with interests, the aptitude of the learners and taking into account differences between the students. From the atmosphere a learning environment that facilitates the learning process and operations will help learners find information and organize their own information, and apply knowledge rationally from organizing content and activities in accordance with interests, the aptitude of students and taking into account differences, organization of learning environments that facilitate the learners to learn And operations to link knowledge with the process, allowing students to participate in every step of the studies, having learning activities to development of talents and learning skills in the potential.

III. METHODOLOGY

Development of science learning management model to inquiry integration for improving achievement of secondary education in 12th grade students at Chumphaesuksa school, Thailand was action research of this study.

➤ *Participants Method*

Participants by brainstorming of 19 keys informant including the science teachers instructional and the experts for developing model and evaluating model. And participants to instructional by a model secondary education in 12th grade students at Chumphaesuksa school were 184 students in 6 classrooms at Chumphaesuksa school, Thailand. They all were purposive sampling.

➤ *Collection Method*

The data collection, step 1, to reviews of documentary study, step 2, to participatory action learning by brainstorming of 15 keys informant including the science teachers instructional and the experts for developing science learning management model to inquiry integration for improving achievement, step 3, to evaluating of a model by evaluation questionnaire of 5 rating scales with the 9 experts for studying suitability level, step 4, using science learning management model into science content instructional of 4th contents including Petroleum, *Polymers, Biomolecules*, World of astronomy and space with secondary education in 12th grade students of 184 students for studying efficiency on according to specified criteria of 80/80, and students' achievement by testing before and after of learning, and to survey by questionnaire of 5 rating scales with the students for studying satisfaction level to the data.

➤ *Data Analysis*

The development of science learning management model to inquiry integration for improving achievement of secondary education in 12th grade students at Chumphaesuksa school, Thailand in data analysis to analyzed by descriptive statistically, percentage, mean, standard deviation, and t-test.

IV. RESEARCH RESULTS

The development of science learning management model to inquiry integration for improving achievement of secondary education in 12th grade students at Chumphaesuksa school, Thailand were followed:

- Science learning management model to inquiry integration for improving achievement of secondary education in 12th grade students at Chumphaesuksa school, Thailand to shown on figure 1.

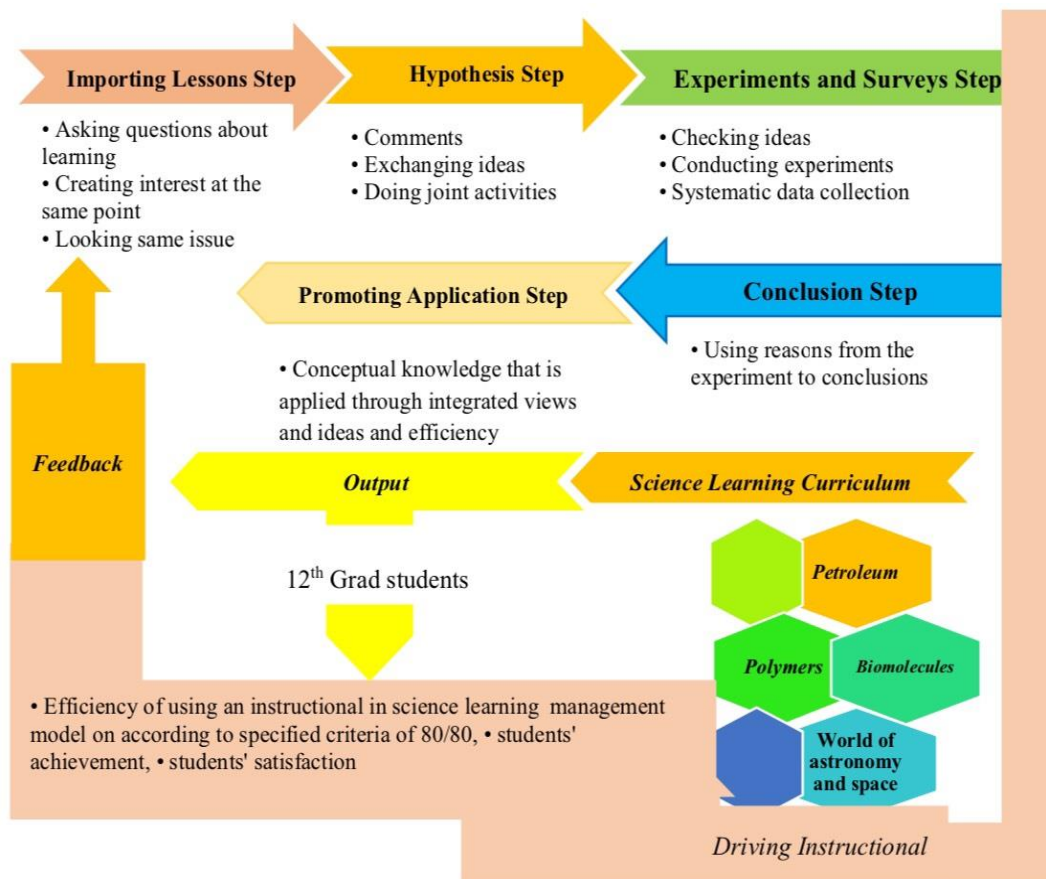


Fig 1:- 5th factors of science learning management model

Science learning management model to inquiry integration for improving achievement of secondary education in 12th grade students at Chumphaesuksa school, Thailand of 5th factors as;

- **Importing Lessons Step:** from asking questions that are relevant to the story to be learned so that students can use their thoughts, and focusing the same point, look at the same issue then leaving a session for thinking students, also including the reason why you are thinking. Note of the thoughts of each students.
- **Hypothesis Step:** by allowing students to express opinions on issues and exchanging the ideas for students to have joint activities, and interaction with each other.
- **Experiments and Surveys Step:** from allowing students to check their ideas by conducting experiments, surveys and data searches to obtain data, when there is data, the

data will be recorded and systematically collected for using the informations and conclusion.

- **Conclusion Step:** from experiments / surveys for students to used a reasoning to draw conclusions. In this stage there must be a reasonable debate and sufficient time for having the students thinking together and summarize of the results as conceptual.
- **Promoting Application Step:** from promoting application and related to daily life or other sciences. Which the teacher has to ask the question about how the knowledge or knowledge gained will be used by students?, what are the views and perspectives?, include how can it be applied and integrated with other content?

A level to suitability of science learning management model to inquiry integration for improving achievement of secondary education in 12th grade students at Chumphaesuksa school, Thailand to shown on table 1.

Contents	Suitability level		Meaning
	Mean	Stand.	
1. Step and Processes of Instructional Model	4.50	0.50	High
2. Procedures of Instructional Model	4.46	0.54	High
3. Using Practice of Instructional Model	4.49	0.51	High
4. Benefits for Using Instructional	4.47	0.53	High
Totals	4.48	0.52	High

Table 1:- Mean, Stand., and suitability level (n=9)

Level to suitability of science learning management model to inquiry integration for improving achievement of secondary education in 12th grade students at Chumphaesuksa school, Thailand of high levels (\bar{x} =4.48, S.D.=0.52). When considered in each aspect, the areas with the highest mean in descending order (1-3) of step and processes of instructional model (\bar{x} =4.50, S.D.=0.50), using practice of instructional model (\bar{x} =4.49, S.D.=0.51), and benefits for using instructional (\bar{x} =4.47, S.D.=0.53). Respectively.

- The efficiency of using an instructional in science learning management model into science content instructional of 4th contents including Petroleum, Polymers, Biomolecules, World of astronomy and space of secondary education in 12th grade students at Chumphaesuksa school, Thailand on according to specified criteria of 80/80 to shown on table 2.

Science Content Instructional	Efficiency		E ₁ / E ₂
	E ₁	E ₂	
1. Petroleum	85.50	94.50	85.50/ 94.50
2. Polymers	86.50	94.50	86.50/ 94.50
3. Biomolecules	86.00	94.50	86.00/ 94.50
4. World of astronomy and space	88.00	94.50	88.00/ 94.50
Average	86.50	94.50	86.50/ 94.50

Table 2:- Percentage scoring efficiency (n=186)

Efficiency of using an instructional in science learning management model into science content instructional of 4th contents including Petroleum, Polymers, Biomolecules, World of astronomy and space have to criteria efficiency in average percentage, E₁/ E₂ of 86.50/94.50. By observing with the teaching record into instructional, which the student can use questions to search for knowledge in various subjects by oneself and be able to analyze problems from cause to effect, have to creative and able to apply principles discovered rules by using scientific process skills to make students of thinking and pretending include solving the problems.

- Science achievement of secondary education in 12th grade students at Chumphaesuksa school, Thailand to shown on table 3.

Testing	Scoring (40)	Mean	Stand.	Percentage	t-test	Sig.
Before	4,873	26.20	0.26	65.50	1.442**	.01
After	7,440	37.80	0.37	94.50		

**significant .01.

Table 3:- Mean, Stand. of Science achievement by comparison between before and after scoring, and t-test (n=186).

Science achievement of secondary education in 12th grade students to higher scores after than before to statistically different at significance level of .01.

- A level to satisfaction to instructional by science learning management model to inquiry integration for improving achievement to shown on table 4.

Satisfaction	Satisfaction level		Meaning
	Mean	Stand.	
1. Promoting science teaching and learning in the process of searching for knowledge efficiently	4.48	0.51	High
2. Science learning management model for making students to sustainability science education	4.45	0.55	High
3. Learning content in a systematic and clear manner that creating a new knowledge	4.43	0.57	High
4. Able to continuously for developing students and increase knowledge	4.47	0.53	High
5. Making students have to attitudes in learning science	4.48	0.52	High
Totals	4.46	0.54	High

Table 4:- Mean, Stand., and satisfaction level (n=186)

Level to satisfaction to instructional by science learning management model to inquiry integration for improving achievement of high levels (\bar{x} =4.46, S.D.=0.54). When considered in each the areas with the highest mean in descending order (1-3) of Promoting science teaching and learning in the process of searching for knowledge efficiently (\bar{x} =4.48, S.D.=0.51), Making students have to attitudes in learning science (\bar{x} =4.48, S.D.=0.52), and Able to continuously for developing students and increase knowledge (\bar{x} =4.47, S.D.=0.53). Respectively.

V. DISCUSSIONS

Science learning management model to inquiry integration including a importing lessons step, hypothesis step, experiments and surveys step, conclusion step, and promoting application step, and suitability of model at a level of high levels. Efficiency in using a model to instructional have to criteria efficiency in average percentage of 86.50/94.50. Students' achievement to higher scores after than before to statistically different at significance level of .01. Students' satisfaction at a level of high levels. As a result of teachers will rely on concepts or teaching styles that suitable for students. Besides, giving importance to students by considering the roles and ideas is what makes this teaching style to emphasize the role of students to participate in teaching and learning activities all the time and promote learners' opinions. [6] Which the students can use questions to search for knowledge in various subjects by oneself and be able to analyze problems from cause to effect, have to creative and able to apply principles discovered rules by using scientific process skills. Holm, M. [7] scientific processes able to promote research behavior to seek knowledge arising from thinking. Practice and systematically until it becomes proficient and can be applied to solve problems in daily life. McMillan, J. H. [8] learning management that has a variety of learning content for each unit For students to practice their study skills and assess their knowledge. A making students eager to learn as well. Scientific process skills are intellectual skills or thinking skills that use scientific methods to solve problems. In which students' practice science process skills to maximize academic performance.

VI. CONCLUSIONS

Science learning management model to inquiry integration for improving achievement 5th factors as; *Importing Lessons Step*: from asking questions that are relevant to the story to be learned so that students can use their thoughts, and focusing the same point, look at the same issue then leaving a session for thinking students, *Hypothesis Step*: by allowing students to express opinions on issues and exchanging the ideas for students to have joint activities, *Experiments and Surveys Step*: from allowing students to check their ideas by conducting experiments, surveys and data searches to obtain data, when there is data, *Conclusion Step*: from experiments / surveys for students to used a reasoning to draw conclusions, *Promoting Application Step*: from promoting

application and related to daily life or other sciences. Suitability of model at a level of high levels. Efficiency in using a model to instructional have to criteria efficiency in average percentage of 86.50/94.50. Students' achievement to higher scores after than before to statistically different at significance level of .01. Students' satisfaction at a level of high levels. Students can use questions to search for knowledge in various subjects by oneself and be able to analyze problems from cause to effect, have to creative and able to apply principles discovered rules by using scientific process skills.

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