A SURVEY ON THE CURRENT SITUATION OF ONLINE SCIENCE LEARNING BY TEACHERS TO IMPROVE PROBLEM- SOLVING SKILLS OF PRIMARY SCHOOL STUDENTS

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ABSTRACT

The objectives of this research were investigated the current situation of learning management in science subjects to improve problem-solving skills of primary school students through online learning by teachers in schools in Dusit district of Bangkok. The population was science teacher from 34 schools in Dusit district Bangkok of Thailand. Purposive sampling was used to only choose teachers who teach with online learning. The instrument of data collection was a questionnaire about the conditions of online learning in science subjects that promote problem solving skills in elementary school students. The statistics were used to analyze the data consist of mean (x) and standard deviation (S.D.)

The results showed that the performance level of teachers implementing online science learning according to the learning management that promote problem solving skills of elementary students was at the medium level in all aspects with scores ranging from 3.14 - 3.54.

Keywords: The current situation of science online learning, Problem solving skill

INTRODUCTION

Life in 21st century needed various skills to deal with life problems. Thus, education system required preparing students ready to learn diverse skillsets to succeed in life (Pacific Policy Research Center, 2010). Analysis of labor market demand by the World Economic Forum (WEF) summarized essential skills for the 21st Century (21st-Century Skill) into 16 skills (P21 Framework, 2015). Problem-solving was an important skill. In addition, curricula trends focused on developing students to become problem solvers (Buranakanit, S., 2013; Ministry of Education, 2017). Thus, problem-solving skill was the key aptitude which teachers use to encourage learner achieve quality required by the curriculum (Praphasawat, J. & Sarayutpitak, J., 2020)

To improve students having problem-solving skill, teachers required seven characteristics of learning management strategy. First, students were practiced critical thinking process. Second, the learner was challenged with new situations including issues or situation in everyday life (Weir, 1974). Third, student was encouraged to do research, and allowed them to find way to solve a various problem with rational thinking. There were suggesting ways to solve problems. Fourth, increasing of experience that student can solve problems with different allowing students practice and gain problems by themselves. (Festinger, 1988; Sinngam, Y., 2011; Suksamran, P., & Kaewurai, W., 2019). Fifth, there were encouraging students to create

hypotheses and find causes of problems (Thammabut, M., 2002). Sixth, learning atmosphere in classroom was good and friendly leading learners dare to think and present ideas in class. Finally, there were suggesting ways to interpret the problem and how to plan a solution and method to collect information. Assessments were approach for students to increase the understanding. These ways ensured students being able to follow the problem-solving process until the problem- solving can be concluded (Somprasong, S., 1980; Sinthaphanon, et al., 2012). Therefore, learning management strategy that promotes problem-solving skill should be composed with these characteristics.

Currently, outbreaks of the COVID-19 virus led to using of distance teaching methods in many countries including teaching online by Massive Open Online Courseware (MOOC) and applications which allow teachers to teach in a virtual classroom (Virtual Classroom). Broadcasting via television signals also was applied. The student cloud continues to study at home while schools were closed (Vanichanan, P., 2020). In an educational context, educators should act as facilitators and guides, demonstrating to students how to extract the most value and utility from e-learning technologies by selecting, sorting, creatingand utilising tools and informational content available through digital mediums to make education more efficient, effective and engaging for learners. (Taweethong, N., 2018) In Thailand, there were distance teaching 4 methods. First, on air was distance learning television via DLTV that distributed learning and teaching management from Wangklaikangwon School expanding to other area. Students cloud learned both broadcasted according to the schedule and watching back. Second, online was distance learning which teachers performed through tools that the school distributed to students. This online method was the most using in distance teaching and learning. Third, On Demand is used through an application. Finally, in case that school cannot manage teaching and learning in other format as mentioned above, on hand study format was the optimal choice. On Hand was giving worksheets with students for self-study at home. Teachers visited the students from time to time or allowed parents act as teachers. This method supported students continue to study. Although the schools were closed, the learning must continue. (Office of the Basic Education Commission, 2021) . Currently, most educational institutions in Dusit District were managed learning by online format. Therefore, the researcher was interested current situation of learning management in science subjects to improve problem-solving skills of primary school students through online learning. Whether science teachers in schools in Bangkok's Dusit district had feature-based learning that promoted problem-solving skills of students, and what any problems or obstacles in promoting problem-solving skills while teaching and learning in science subjects online that they had.

Thus, the researcher aim to explore the current situation of learning management in online science learning whether science teachers promoted problem-solving skills of students at elementary school level, and whether seven characteristics of learning management strategy was inserted in their teaching. The data collection instrument was a questionnaire with science teacher at elementary level from 34 schools.

Research question

Whether current condition of science online learning management of teachers at schools in Dusit district of Bangkok promotes problem-solving skills in online teaching of primary school students or not, and how they performed.

Research objective

To explore the current condition of learning management in science subjects to improve problem-solving skills of primary school students through online learning by teachers in schools in Dusit district of Bangkok.

METHOD

The researcher used a survey research methodology by using a questionnaire in this study.

Target group

The population consisted of 170 primary school science teachers from schools in Bangkok Dusit district. The sample group was elementary school science teachers of schools in Dusit district of Bangkok amount 118 teachers from 34 schools choosing by purposive sampling. Only teachers that manage online learning was selected in this study.

Research tools

The researcher used questionnaire about the condition of science online learning management which promotes problem-solving skills of elementary school students as a tool to explore the conditions. This questionnaire divided into 4 parts. The procedure of creating and developing tool was as follows:

1) Study principles, concepts, and determine related issues to create questionnaire regarding define the scope of the questionnaire content. The questionnaire comprised of 4 parts including

Section 1: General information of the respondents

Section 2: Questionnaire for opinion about condition of science online learning management which promotes problem-solving skills of elementary school students

Section 3: Problems and obstacles encountered from online learning management which promotes problem-solving skills

Section 4: Other problems

2) Determined issues related condition of online learning management in science subjects that promote problem-solving skills in draft questionnaire according to the conceptual framework. The issues in each aspect consisted of

Aspect 1 Thinking skills practice

Aspect 2 Challenging learners with new situations

Aspect 3 Encouraging learners to seek solutions

Aspect 4 Allowing learners to practice by themselves

Aspect 5 Encouraging learners to set hypotheses and find cause of problems

Aspect 6 creating a good atmosphere in classroom

Aspect 7 Suggesting ways to interpret the problems and assess the learner's understanding of problem-solving

3) The questionnaire was validated by 3 experts to estimate the consistency (IOC) between practice items in questionnaire and stated objectives according to the learning management guideline with 7 characteristics. Evaluation was divided into 3 levels was as follows:

+1 means the practice item was consistent with determined objectives

0 means uncertain that the practice item was consistent with determined objectives

-1 means the practice item was inconsistent with determined objectives

4) Analyzed the results of evaluation of consistency (IOC) from the opinions of 3 experts. This finding showed that the index of consistency (IOC) of the questionnaire ranging from 0.67 - 1.00.

5) Improved the questionnaire according to expert recommendations.

Data collection

A study of condition of science online learning management that promotes problem-solving skills of elementary school students.

The researchers collected data about condition of online learning management in science subjects of teachers that promote problem-solving skills. Collecting step was as follows:

1) The researcher sends a questionnaire about condition of online learning management in science subjects of teachers that promote problem-solving skills in Google forms to primary science teachers via email amount 118 copies. Delivery method was followed the teachers' willingness.

2) The researcher followed and collected the questionnaire data after submitted the Google form of questionnaire for 1 month.

3) The researcher analyzed data that gathered by blinding data. Collected data was not labeled or represented the data of the sample.

Data analysis

The data was analyzed by using statistical analysis as follows:

1) Basic statistics included percentage, mean (x) and standard deviation (S.D.)

2) Statistics used to determine tool quality including index of consistency (IOC), Item-total correlation, Confidence value of whole questionnaire was determined by seeking of Cronbach's alpha coefficient.

RESULTS

This research collected data divided into 2 sub-parts as follows:

Part 1 Studied the online learning management of science subjects of teachers that promoted problem-solving skills of primary school students. The results of the survey showed that performance level of teachers which managed online science learning according to the learning management that promote problem solving skills of elementary students was at medium level in all aspects with scores ranging from 3.14 - 3.54. When consider this finding in each item, it was demonstrated that learning management characteristics that promote problem-solving skills of primary school students of teachers had the highest performance level was the aspect of challenging learners with new situations (x=3.54,S.D.=0.174), and followed by the aspect of thinking skills practice. Then, it followed by aspect of creating an atmosphere in the classroom (x =3.52, S.D.=0.152,0.350), aspect of allowing learners to practice by themselves(x= 3.38, S.D.=0.284), aspect of suggesting ways to interpret problems and assess the learner's understanding of problem solving(x=3.34, S.D.=0.358), and encouraging learners to seek solutions(x=3.30, S.D.=0.094), respectively. The aspect of encouraging learners to set hypotheses and find cause of problems was learning management feature that had the lowest performance level (x=3.14, S.D.=0.219). These details were showed in table 1

learning management features that promote problem solving skills	$\bar{x}$	S.D.	Performance level
Aspect 1 Thinking skills practice	3.52	0.152	medium
Aspect 2 Challenging learners with new situations	3.54	0.174	medium
Aspect 3 Encouraging learners to seek solutions	3.30	0.094	medium
Aspect 4 Allowing learners to practice by themselves	3.38	0.284	medium
Aspect 5 Encouraging learners to set hypotheses and find cause of problems	3.14	0.219	medium
Aspect 6 creating a good atmosphere in classroom	3.52	0.350	medium
Aspect 7 Suggesting ways to interpret the problems and assess the learner's understanding of problem-solving	3.34	0.358	medium

Part 2 Studied condition of problems and obstacles regarded online learning that enhance problem- solving skills divided into 2 aspects.

Aspect of equipment and internet connection signals was explored. This finding showed that 80 % of respondents informed that there was different availability of equipment in each family. Some students had to share learning devices with other family members at their homes. Insufficiency of learning devices created a gap resulting in students cannot participates in some activities. In terms of internet connection, there was a problem of signal instability during rainy season, and 20% of respondents were ready availability of equipment and internet signal.

Aspect of media and technology skills also was explored. This finding presented that 90 % of respondents were skilled in using technology for teaching online because they had familiar with the systems of online learning management. However, instructor required learning new technology media to motivate learner attended online learning without boring. Moreover, respondents indicated that the parents and students was not understood and lacked technology skills in some families, and 10 % of respondents had moderate skills in using technology media.

CONCLUSION AND FUTURE WORK

Exploring condition of teachers' science online learning which promotes problem-solving skills for elementary school students along with the learning management 7 characteristics. The researcher found that overall performance of teachers in 7 aspects was moderate level. These results consistent with Chanthasen, C., Sitti, S., & Sangprajak, A. (2017, p. 59) which performance level of teachers' science who enhance problem-solving skills were moderate. This study collected data while teachers were teaching onsite and learning at school. This finding indicated that the performance level of teachers who promoted problem-solving skills in online learning and normal onsite learning management were not different. The aspect with the highest performance level was the aspect of challenging students with new situations, and the aspect with the lowest performance level was the aspect of encouraging students to hypothesize and find the cause of the problem.

The problems and obstacles in online learning management that promote problem-solving skills of teachers include the learner's family lacked the availability of equipment because they had to share learning devices with other family members. Another problem was the instability

of the internet signal of both teachers and students. This finding was consistence with Lassoued, Alhendawi, & Bashitialshaaer (2020, p.7) and Marek, Chew, & Wu (2021, p.97). When teacher was unable to fully implement learning management that enhances students' problem-solving skills will affect the problem-solving skills of primary school students in online classes. This finding was consistent with Phanporn Namnorinthorn (2012, p. 92) who found that students had problem-solving skills because of the teacher's learning behavior. These can be confirmed that the teacher's learning behavior affects problem-solving skills of learners.

Suggestion

From the results of a survey regard condition of teachers' online learning management in science subjects by using questionnaires. Interestingly, observations in this study were found that teachers had different teaching experiences affect different understandings of the practices items of the learning management features that promoted problem-solving skills for all 7 aspects. The future studies, understanding of science learning management features that promote problem-solving skills should be assessed prior to questionnaire-based data collection in order to the teacher will be reflect clearer performance level.

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