

A Development of Mathematics Lesson by Using Dbook Pro

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Abstract

The purpose of this research was to develop Mathematics Lesson by Using Dbook Pro. The target group was 9th grade students during 2019 academic year which use Lesson Study and Open Approach according to Inprasitha (2011; 2017). The instruments were: 1) 9th Mathematics textbook 2) Voice Recorder 3) Video Recorder 4) Camera. The Lesson Study teams which do Lesson Study weekly cycle comprised of the experts and graduated students. Research conducted under Lesson Study Framework of Inprasitha (2011; 2014; 2017) which consists of 3 steps; (1) planning Mathematics Lesson by using Dbook Pro (2) The use of Mathematics Lesson by using Dbook Pro in the classroom base on Open Approach (3) Reflection of the use Mathematics Lesson by using Dbook Pro in the classroom. Data collection had 2 Lesson Study cycles with 3 classroom. Data analysis was based on Classroom Protocol, Worksheet, Students interview and reflection of the Lesson Study team. The results revealed that : 1) The Lesson Plan with instructional media based on dbook Pro and real object was developed by Lesson Study team that validity because the team consist of the experts and try-out process with Open Approach. Electronics board from dbook Pro can expand importance part and students' idea more clearly, increase student learning efficiency and teachers could prepare the board before real teaching. (2) the results of student learning based on the focus group interview and observation in classroom showed students' participate and it caused students positivity perspective with learning mathematics and Learned that Mathematics could Integrate with Arts and physicals education.

Keywords – Mathematics Lesson, Dbook Pro, Open Approach, Lesson Study

I. INTRODUCTION

Learning in the 21st century is a context for learning in the rapidly changing world. Therefore, students must be prepared to study and work in this century. [1] Essential skills in this century are thinking skills, such as complex thinking. And creative thinking. [2] One of the fundamental basis for preparing people for a career is Geometry. The importance of geometry is to help students understand, explain and reason the real world situations that are related to geometric concepts. [3] But the results of a national study of the United States found that the ability to reason geometrically and to look at dimensional relationships still below the standard [4] Consistent with the Thai context, the international assessment results of 8th grade students found that the students have the lowest geometric mean scores from all 5 contents. [5] Junior high school mathematics curriculum should have a study of geometry in a variety of tasks. It also gives students opportunity to reason and solve problems from their real world. [6]

This new class is focuses on the students' idea. In which the students' ideas are abstract, use problem situations are able to catch out students' ideas. [7] Technology is one of the important aspects of mathematics learning. It will be able to make students more accessible to mathematics and supports students to connect mathematical concepts. [8] One of the technology is dbook Pro program has an important feature is encouraging students to connect their real world to the mathematics world. And able to post the problem situations that stimulate student's interest. [9] From the geometry classroom, there are aspects that can be improved by using dbook Pro, which is the import of videos showing problem situations. In order to remain the student's curiosity to solve problems. In the context of Thailand, Lesson study is used to improve the classroom. For teachers to know their students and have classroom planning together [10] By using with Open Approach is an opportunity for students to solve problems by themselves and makes teachers see that students have various ways of thinking [11] Therefore, the purpose of this research was to develop

Mathematics Lesson by Using dbook Pro in geometry content mathematics classroom using Lesson Study and Open Approach.

II. PROPOSED ALGORITHM

2.1 Lesson study and Open Approach

Lesson study is classroom development using lessons as a tool for teachers to know their classroom from the point of their students. Lesson study based on the concept of Inprasitha (2011) as follows: 1) collaboratively design a research lesson (Plan) 2) collaboratively observe the research lesson (Do) 3) Collaboratively discuss and reflect on the research lesson (See)

Open Approach is a teaching that focuses on students to solve problems by themselves. Focuses on students to learn. It consist of 4 steps follow as : 1st step Posing Open-ended Problem, 2nd step Students' self learning, 3rd step Whole class discussion and comparison and 4th step Summary through connection students' ideas. (Figure 1)

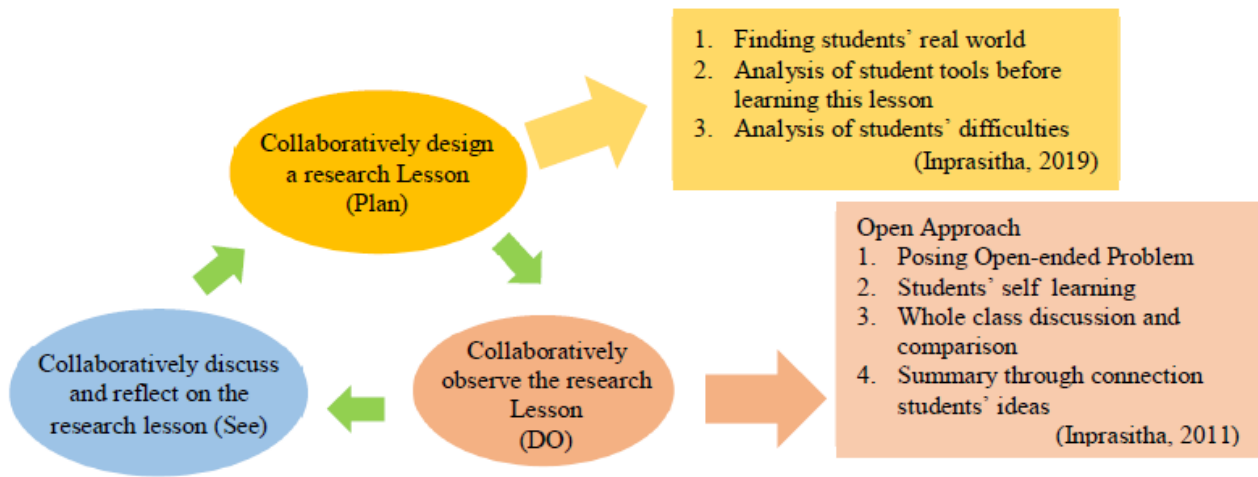


Figure 1. Figure 1 Lesson study and Open Approach

2.2 dbook Pro Program

Dbook PRO is a computer program created by CRICED University of Tsukuba in Japan is a collaborative effort of educational technologists and mathematics researcher ; Mathematics Education, Khon Kaen University. It has been developed into a Thai language format That will use the strengths of digital technology to develop electronic lessons to help with teaching and learning activities (Inprasitha ,2015) To increase efficiency dbook Pro consist of 2 modes follow as :

- 1) Editing mode : used for creating, designing, adjusting lessons
- 2) Teaching mode : can try out educational activities or use real teaching which consists of Mathematics tools in Figure 1



Figure 2. Figure 2 dbook Pro tools

2.3 Process of Development

Lesson study team which consists of 3 experts and 5 graduate students do the weekly cycle of lesson study. In each cycle; Team start form planning lesson and use in Open Approach classroom then reflection and improve lesson by plannig next cycle for 2 cycles in Figure 3. In each cycle consists of Lesson Study Process based on the concept of Inprasitha (2011) as follows: 1) Plan: Planning Mathematics Lesson by using Dbook Pro 2) Do : The use of Mathematics Lesson by using Dbook Pro in Open Approach Classroom (Inprasitha, 2011) as follows : 1) Posing Open-ended Problem by using Dbook Pro 2) Students' self learning

3)Whole class discussion and comparison by using Dbook Pro 4)Summary through connection students' ideas by using Dbook Pro 3) See : Reflection of the use Mathematics Lesson by using dbook Pro.

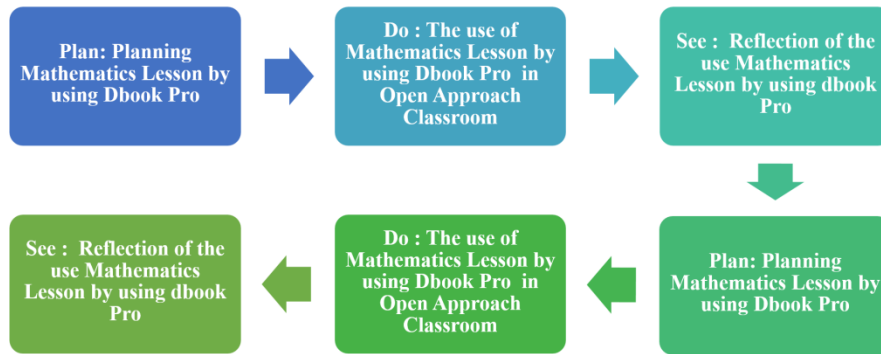


Figure 3. Figure 3 Development Process

III. EXPERIMENT AND RESULT

The product of the development is a lesson plan with dbook pro and real instructional materials through Open Approach as the way of teaching and process by Lesson Study. The process used in this research and development is Lesson Study cycle as follows ;

1. The 1st Lesson Study Cycle

1.1) Plan: Planning Mathematics Lesson by using Dbook Pro

Lesson was designed by Lesson study team Lesson to be developed is “Introduction of circle”. The development item in this step were Lesson Plan based on Open Approach , Instructional media based on dbook Pro and Instructional material as real objects.



Figure 4 Lesson study team collaboratively planning Lesson

1.2) Do : The use of Mathematics Lesson by using Dbook Pro in Open Approach Classroom

As this step, the Lesson was conducted with the 1st classroom with 50 students at 10 groups.



(a) Before improvement

(b) after improvement

Figure 5 (a) 1st dbook pro (b) students self-learning

1.3) See : Reflection of the use Mathematics Lesson by using dbook Pro

This step is for revision the Using in classroom. Lesson study team reflect students ideas and discuss about using dbook pro in classroom.



Figure 6 1st cycle Reflection

The 2nd Lesson Study Cycle

2.1) Plan: Planning Mathematics Lesson by using Dbook Pro

Lesson study team edited problem situation and task from reflection Based on the results of Lesson using. According to experts reflection



Figure 7 Lesson study team collaboratively planning Mathematics Lesson

2.2) Do : The use of Mathematics Lesson by using Dbook Pro in Open Approach Classroom

Students' idea in classroom which using dbook Pro most of their follow the students' idea anticipate but some of them out of the anticipate that should improve in next classroom . Using dbook pro in classroom improved by use more tools in program and teacher plan additional materials for whole class summarize. Students' participation and behavior from observing and students' interview : Students had appropriate participation and had positive view with learning mathematics



Figure 8 students participate in classroom activity

2.3) See : Reflection of the use Mathematics Lesson by using dbook Pro

The expert reflect about instructional media and hot to develop it. From reflection; Classroom had to improve main materials, problem situation and tasks for the next classroom.



Figure 9 2nd cycle Reflection



(a) Before improvement

(b) after improvement

Figure 10 (a) Before improvement (b) after improvement

Figure 10a illustrates the Instructional media before reflection. According to comments and suggestions for improvement from expert. The revision was done based on the comments and suggestions from the experts. Figure 10b illustrates the Instructional media after reflection.

IV. CONCLUSION

Based on the development of Mathematics Lesson it can be concluded that 1) The Lesson Plan with instructional media based on dbook Pro and real object was developed by Lesson Study team that validity because the team consist of the experts and try-out process with Open Approach. Electronics board from dbook Pro can expand importance part and students' idea more clearly, increase student learning efficiency and teachers could prepare the board before real teaching. (2) the results of student learning based on the focus group interview and observation in classroom showed students' participate and it caused students positivity perspective with learning mathematics and Learned that Mathematics could Integrate with Arts and physicals education.

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