The Development of Project-Based Learning Through Boyolali Local Wisdom as a Milk Town

Triyono[1*], Imam Sujadi[1], Diari Indriati[1]

[1] *Magister Program of Mathematics Education, Sebelas Maret University, Surakarta, Indonesia*
Corresponding author. Email: salatigatriyono8@gmail.com

ABSTRACT

Since 2013, learning has been required to prepare pupils in developing skills in XXI Century. Project Based Learning is one of learning method suggested by teachers. However, obstacles and weakness can still be found at the process. The obstacles found by teachers are used to determine basic questions. Hence, the objective of this research is to make this existed learning perfect. The development model in this research uses 4-D models, which are define, design, develop and dissemination. First of all, analyse the need until Project Based model depiction based on local wisdom and analysis of problem source as Boyolali Milk Town can be achieved. Response and suggestion to repair the existed learning model can be found as the result through FGD at Boyolali MGMP. From the result, it is found 70% teacher agree this learning model can be applied in class at statistics lesson. Furthermore, this kind of learning model is able to develop students' skill in preparing 4C ability needed in XXI century. Those things can be seen from the existed learning process.
Keywords: project base learning, local wisdom

1. INTRODUCTION

2013 Curriculum 2013 has been applied since 2013. The objective of changing onto 2013 Curriculum is to prepare humans living in 21 centuries. Skills possessed to face this thing, according to Bernie Trilling and Charles Fadel (2009:48) "the core subjects and interdisciplinary 21stcentury themes are surrounded by three sets of skills most in demand in the 21st century: (i) learning and innovation skills, (ii) information, media and technology skills, (iii) life and career skills". Same as that opinion, National Education Association (2002) 21st Century Skills given to each person, which one of the 21st century skills are learning and innovation skill that consists of 4 aspects, those are critical thinking, communication, collaboration, and creativity. From the reason above, is directed to train 21st century skills.

Project based learning is recommended learning model in the learning implementation of 2013 Curriculum. That is also for Mathematics learning. In Boyolali regency, based on survey result from Boyolali MGMP forum, most schools applied Project Based Learning in mathematics learning, especially for schools applying 2013 Curriculum as the curriculum project pilot. In the application, some teachers face obstacle, the obstacles stated by teacher are preparing material in learning, the comfortable of conventional method, lack of time because of the materials as initial problem and problem about administration. In fact, in difficulties conveyed as the Project Base Learning weaknesses are the need of much time for the problem to be finished, a great mount of administration, many teachers who feel comfortable in traditional class where they hold major role at class, many equipment to be provided and many students having weaknesses and experimenting and data collecting who will difficulties. There is any possibility for students who are not active in group work, when the topics given in each group different, they are worried unable to understand the whole topics.

In the other side, there hasn't been schools yet which using the local wisdom of Boyolali as milk town as teaching and learning materials. Meanwhile, the state government has not had special policies to keep the wisdom. Whereas the students' composition is native inhabitant of Boyolali. They are closely related to activities about that local wisdom.

Therefore, the objective of this paper is to do the development of Project Base Learning Model Through Boyolali Local Wisdom as a Milk town. The development of the research is to give learning solution in the application of 2013 curriculum based on the objective changing from 2013 Curriculum, that is to prepare skills in 21st century.

2. RESEARCH METHOD

This research is the kind of research and development which has purpose to develop learning model with local wisdom. This research in conducted in SMA Bhinneka Karya 2 Boyolali and Boyolali Mathematics MGMP where MGMP is used to collect initial data about learning conducted by Mathematics teachers in Boyolali and do Forum Group Discussion (FGD) activities to get response and suitability about learning while in SMA Bhinneka Karya 2 Boyolali. experiment in small scale is conducted. Model 4-D development model consists of 4 major stage, those are defined, Design, Develop and Disseminate.

3. RESULTS AND DISCUSSION

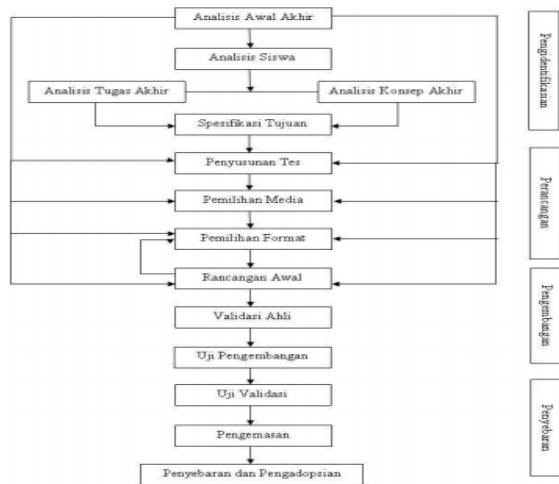Based on the development model using 4-D model, the model covers: Define, Design, Develop and disseminate.

Figure 1 4-D Model

In Define stage, itis found that in mathematics, learning form MGMP forum, in 2017, schools applying 2013 curriculum reach 90%. In the application, teachers have done learning model recommended by 2013 curriculum. Project Base Learning models is one of the applied model learning. Obstacles which appear for teacher are the difficulty to find the problem root to begin this PjBL model, teacher' condition that is comfortable with the existed learning and time limitation.

Boyolali as we know that this town has central milk produces from livestock. In Senior High School, there are basic competencies in statistic materials which use statistic process to find real experience or real life to shape thinking skills, especially skills in communication. collaboration, critical thinking and student creativity. Meanwhile, the of objective of student's statistics learning is the students are able to understand and present data in any kind of form.

In design stage, this activities is for designing learning model through project with local wisdom.

Table 1 The Concept of Learning Model Through Project with Local Wisdom

Phase	Activities
Phase 1 Start with essential question 1st meeting	This learning activity start with students in group determine problem from Boyolali Local Wisdom as a milk town. Local wisdom, such as daily milk production in livestock directly, cow woof used up, number of cows in some Boyolali regions. These things started with teachers who give motivation about local wisdom existed in Boyolali and the sign of learning. Teachers also give depiction of activities in one learning process.
Phase 2 Design project 2nd meeting	Then in group, students design to finish the project given at phase 1. That thing related with how long the time needed is assistance done by teacher by giving learning time target determined and lesson plan, and also time also time allocation given at semester program and annual program in learning administration
Phase 3 create schedule 3rd meeting	Students create schedule and present to others in front of the class to get response from teacher. Teacher give guidance about activities arrangement to get response from all classes, so the project can be finished on time. After this meeting, teachers ensure that students have started to work in group.
Phase 4 monitoring the students and progress of project 3rd meeting	After students' activity runs for a while teacher do supervision by having discussion about obstacles faced by students. That thing is done to assist learning activity. Besides, it can be used to make learning strategy perfect.
Phase 5 assess the outcome 4th meeting	Assessment is done by each group by doing presentation. Assessment is based on student's ability to communicate, student's creativity to convey and show data, equalization of perception about students and cooperation, and student's ability to give opinion in conveying (critical thinking) materials presented.
Phase 6 evaluation the experience 5th meeting	In the final learning process, teacher and students do reflection about activities and project result which have been done. Reflective process is done individually and in group. In this phase, students are required and their feeling and experience during project finishing. Teacher and student develop a discussion in order to repair the work during learning process, so it is found new inquiry at last to answer problem faced in the first in the learning phase.

The next stage is development stage. In this stage, expert's validation by product experimenting is done. Expert's validation consists of materials experts and language educators experts. Expert state that this model can be applied with cases suitability which made more specific and more stronger expert in learning process, especially in the process. From curriculum experts it is found and fulfilled learning criteria which develop student's ability in training the ability of critical thinking, creativity collaboration and student's ability to communicate. Furthermore, validator also give explanation if itis possibly done it can be developed to HOTS learning.

Table 2 Validation Result of Language Expert

Note	Result
Using simple language	Excellent
Using communicative language	Good
Using understandable language	Good
Using normative language	Excellent

Language experts state that all aspects have fulfilled the requirements. All aspects required belongs to good category. In other words, the learning model can be used in teaching and learning activities.

Table 3 Validation Result of Curriculum Expert

Note	Result
Suitability between KI and KD of 2013 Curriculum	Excellent
Suitability with 4C skills	Good
Suitability between format and existed rules	Excellent
Suitability with PjBL project	Excellent

Validation from curriculum experts seen on Table 3 shows that suitability between KI and KD, suitability with XXI century skills (4C), format suitability and the model have fulfilled PjBL model which has good standard criteria.
The last stage of 4 – D process is disseminate. In this research, there is only limited experiment conducted in one class of SMA Bhinneka Karya 2 Boyolali. After the last step of this experiment, students feel getting new experience in learning, they feel that they can do group work and it is more fun. They also feel responsible for what they do.

Table 4 Student responses of the Use of PJBL-KL model

Category	Score	Total	%
Very good	20	31	64,51
Good	10	31	35,49
Bad	-	-	-

In the application of mathematics material for XII grade compulsory mathematics has still fulfilled the time in 2013 curriculum application because it has not exceed the time allocation from semester program and annual program of the learning administration.

4. CONCLUSION

This research result states that Project Base Learning Model Through Boyolali Local Wisdom as a Milk Town can be implemented in the teaching and learning activities. This learning model has pointed to 2013 curriculum which prepares student's skills in 21st century. The skills are collaboration, creativity, critical thinking and communication. From the reason above learning has been gathered based on the existed time

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