

The Profile of Students' Lesson-Planning Ability Based on Problem-Solving in Science Learning

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Abstract: This study aims to analyze the students' lesson-planning ability based on problem-solving in science learning. This study used descriptive-qualitative method. 39 in-service teachers student of Distance Higher Education were involved in this study. Essay test was conducted to collect data of lesson-planning ability. The result shows that the students' ability of lesson-planning is still in category moderate. In-service Training of Primary School Teacher Education Program is categorized as quite capable (score 63) in planning science lesson based on problem solving in learning science. It can be concluded that efforts need to be developed an online learning to enhance students' ability of lesson-planning in learning science.

1 INTRODUCTION

Based on regulation of national education minister number 16, 2007th on teacher competence mentioned that teacher always have to do reflective action for improvement of learning quality (pedagogic competence). In this case the teacher is required to reflect on the learning that has been implemented in the classroom. Teachers should take advantage of such reflection results for the improvement and development of lessons learned in the subject matter. If this reflection activity is carried out continuously it will help improve teachers' professionalism. Self-reflection can shape the innovation and revolution of learning in the classroom (Loughran, 2005). Self-reflection is a key element of professionalism (Bowman, 1989). Self-reflection is the key concept of teacher education to promote continuously professionalism (Korthagen and Vasalos, 2005). To become a professional teacher must have at least a professional knowledge of content knowledge, pedagogical knowledge, pedagogical content knowledge (Abdurrahman, 2013). It further said that to improve professionalism, a teacher must be able to solve practical problems in the field (Darling-Hammond, Holtzman, et al., 2005).

Science teaching in the 21st century should offer a variety of contexts that can be developed such as critical thinking, problem solving, and the concept of science itself. It also goes well together with the goal of 21st Century National Education that is to realize the ideals of the nation; prosperous and happiness for the people of Indonesia, and equally honoured with other nations in the global world, through the foundation of a society consisting of competent human resources, that is independent, determined and capable in achieving the ideals of the nation. To achieve the goals, hence it is needed that the human resources must have several competences/skills based on the "21st Century Partnership Learning Framework" (BSNP, 2010), those are: Critical-Thinking and Problem-Solving Skills; Communication and Collaboration Skills; Creativity and Innovation Skills; Information and Communications Technology Literacy; Contextual Learning Skills; Information and Media Literacy Skills.

The achievement on the 21st century as expected as mentioned before, an educational model that takes consideration in utilizing of educational technology is needed, the role of teachers or lecturers and learners, creative teaching and learning methods, contextual teaching materials, independent individual-based

curriculum structure (BSNP, 2010). In line with the mentions by BSNP, then Selvi (2017) suggests the teacher competence that must be owned, as shown in the following chart.

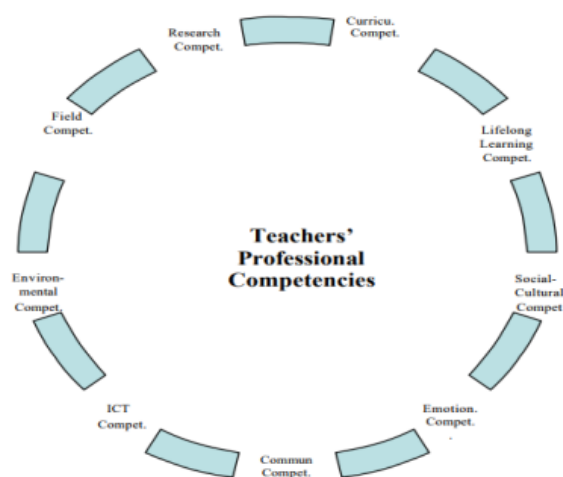


Figure 1: Components of teachers' professional competencies.

The Figure 1 shows that teachers' professional competences were Field Competencies, Research Competencies, Curriculum Competencies, Lifelong Learning Competencies, Social-Cultural Competencies, Emotional Competencies, and Communication Competencies.

However, in reality, the competence of teacher who are expected to meet the objectives, is still far from expectations. Previous research at in-service training program studies college students of distance learning showed that students find difficulties in curriculum competence in learning Science especially when it is related to planning and implementing learning (Widiasih, 2016). For that reason, this research measures the ability of teachers in lesson planning of learning Science based on reflection problem solving.

Problems occur when there is a gap between a person's current state with his/her own desire, where he/she does not know how to find a way out (Hayes as stated by Lorenzo, 2005). Furthermore, Woolfok (2009) states that problems have original state, desired goal, and pathway to achieve that goal. Supporting the idea, Santrock (2008) states that problem solving is a quick way to achieve goals. In general, problems contain questions. Bell (1978) states that a question is a matter for a person, if that person is aware of the situation and requires action that is not immediately resolved.

Kirkley (2003) states that problem solving involves high-level thinking skills such as visualization, association, abstraction, manipulation, reasoning, analysis, synthesis, and generalization. Based on that, it can be inferred that problem solving is a thought process to find the right way to obtain a solution. Presseisen (1985) states that thinking is assumed as a cognitive process, a mental process for acquiring knowledge. Furthermore, it is said that the thinking skills are grouped into two, basic thinking skills and complex thinking skill or higher order thinking. Higher order thinking is grouped into four: problem solving, decision making, critical thinking, and creative thinking (Presseisen, 1985). Thus solving problems requires complex thinking skill or higher order thinking.

According to Nakin (2003), problem solving is a process involving the use of certain steps (heuristics), which are often referred to as model or problem-solving steps to find a solution. Heuristics are common guidelines or steps used to guide problem solving. However, these measures do not guarantee individual's success in solving the problem. This is in contrast to what Brownell (McIntosh, 2000) has stated. He states that a problem cannot yet be called solved even if it has a solution to the problem. It is solved if an individual has yet understood to what he has been done to the problem that is the process in solving the problem and the reason to why the solution is the right one.

The Universitas Terbuka team (2013) addresses the following steps: 1) identifying key or significant information in the case of learning; 2) connecting the information so that a problem or question arises; 3) analyzing the cause of the problem; 4) developing alternative solution for the problem; 5) analyzing the strengths and weaknesses of each proposed alternative; 6) choose one or several alternatives that are considered the most effective. The next step is that the "the one or several alternative solution to be effective" is transferred into preparing lesson planning.

2 METHODS

The sample data used in this research comes from 39 bachelor degree students of In-service Training of Primary School Teacher Education Program with different expertise (non-teacher-educational subject). The instruments used are Essay Test, Multiple Choice, and portfolio of teacher performance in planning of learning. The reason to which the instruments are used is to measure students' ability in

lesson planning based on problem solving. Data is collected through tests and interviews conducted in April 2017. Data is analyzed by descriptive qualitative.

3 RESULTS AND DISCUSSION

When doing the research, the in-service training students were only 2 weeks old of becoming distance learning students, so it was expected that the students had not yet given enough materials from the class. However, 92% of them had already bachelor in educational program while the rest were bachelor in non-educational program.

Table 1: Students' educational background.

Bachelor in	students	
Indonesian Language and Literature Education	1	92%
English Language and Literature Education	10	
Mathematics Education	4	
Islamic Education	11	
Primary Teacher Education (SPDI)	3	
Pancasila and Citizenship Education	3	
Arts Education	1	
Public Health	1	8%
Agricultural Technology	1	
Biology	1	
Economic Managements	2	
Communication	1	
Total	39	100%

The data in Table 1 shows that 92% of students have finished their undergraduate education, so they should be experts in preparing learning implementation plan. Moreover, data in Table 1 shows that 95% of students have experience in

teaching for over 5 years. It is assumed they are experts in preparing the learning Implementation plan. However, in reality, it is still far from expectation.

The experience of teaching students in-service training are varies as shown in the following Table 2.

Table 2: Teaching duration.

Teaching Duration (in year)	Students	%
< 5	10	26
5 - 9	12	31
10 - 14	15	38
15 -20	2	5

Table 2 shows the teaching experience of students is enough, less than 5 to 20 years. However, are they adequate in developing teaching planning?

The Data of "the most effective alternative solution" is transferred into preparing the implementation of lesson planning, students obtained the average score listed in the following chart.

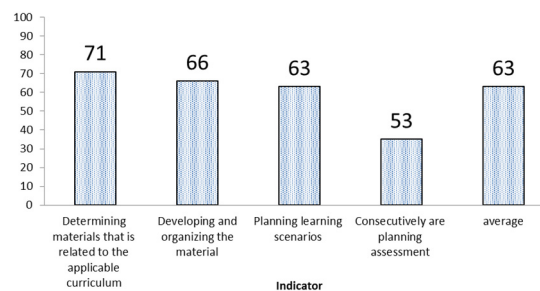


Figure 2: Profile of student's lesson plan science learning ability.

The Figure 1 shows that students' difficulties in preparing the implementation of lesson planning consecutively are determining materials that is related to the applicable curriculum (71 %); developing and organizing the material (66%); planning learning scenarios (63%); and planning assessment (53%). The average ability in preparing lesson planning 63% is category moderate.

Examples of student work are listed below.

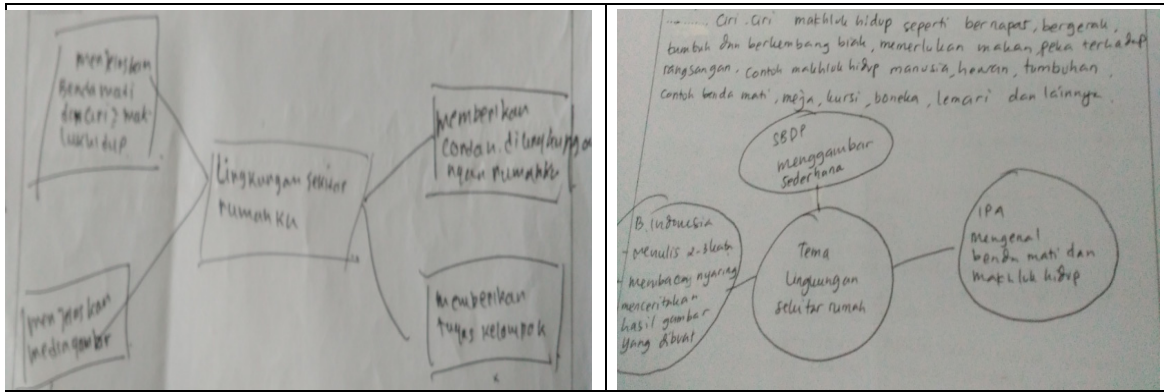


Figure 3: Sample of performance student in developing and organizing the material.

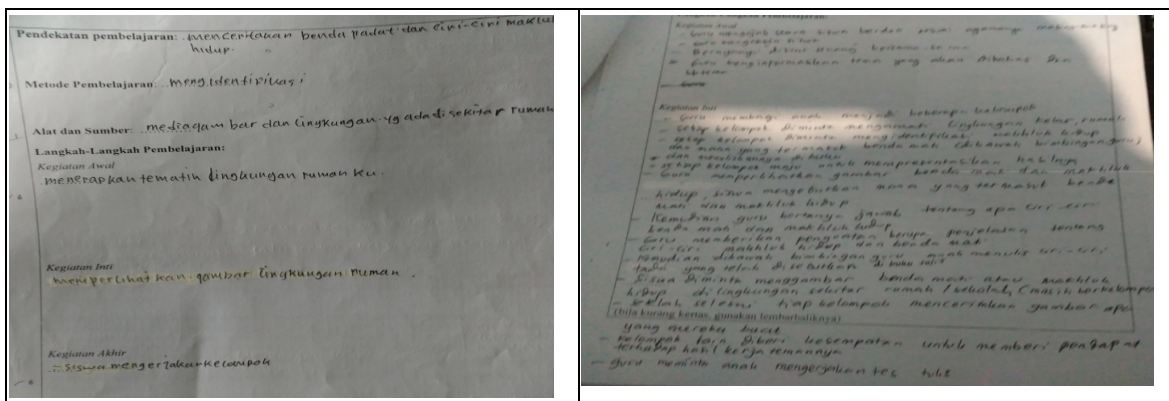


Figure 4: Sample of performance student in planning learning scenarios.

The Figure 3 shows that the performance of teachers in developing and organizing material is generally less coherent and less detailed. The sample of student work in planning learning scenarios as follows.

The Figure 4 shows that the performance of student in planning learning scenarios ranging from incomplete (left) and complete (right). In the less-than-complete student work written in the initial activity it says "implementing the thematic environment of my home". In the core activity it says "show the picture of my home environment". Furthermore, in the final activity written "students do the group". The student whose have bachelor degree in Pancasila and Citizenship Education and 12 years of teaching experience organizes learning materials poorly, while a relatively good organized material is achieved by the student who have bachelor degree in Mathematics Education and a 5 years of teaching experience. This means teaching duration does not guarantee teacher to be able to make a better learning implementation plan. While on the right appear

examples of complete learning steps from opening to closing the correct and complete learning.

Similarly, in preparing steps of learning, it is very varied from less good to a relatively good, as has been mentioned above. Examples of less good learning steps, are as follows: Pre-core activity: applying thematic "my home environment"; Core activities: showing pictures of the home environment; End activities: students work on groups. The situation was very sad, because this student had a bachelor degree in Citizenship Education and had been teaching in elementary school for 12 years. Can you imagine how the quality of learners it produces? Has it been able to meet the expectations of forming competence human resources that can compete in the 21st Century.

Student performance in planning assessment showed the worst result that is 53%. Examples of student work on that part can be seen in the following this table.

Table 3: Sample of consecutively are planning assessment.

Learning objectives	Item of Question
<ul style="list-style-type: none"> • Students can explain about the importance of healthy living • Students can identify objects in the neighborhood • Students can describe the objects that are around 	<ul style="list-style-type: none"> • Mention the properties of light • Mention optical devices and their functions • Mention 4 kinds of eye defects

From Table 3 show that the items developed by the students did not measure learning objectives. The students are mostly weak in evaluating. Most of them make questions with less measurement of learning indicator. For example, the learning indicator of "Students can explain the importance of living healthy", while the question is "Mention the properties of light".

Based on the data of students' ability in preparing lesson planning, the students are still far from expectations. The purpose of developing a learning plan is to provide assurance that learners will learn well. Learning planning is related to the decisions teachers make in organizing, implementing, and evaluating learning outcomes (Burden and Byrd, 1999). Planning is a very important task to do by the teacher. When teachers make decisions about planning, it is necessary to consider "what one does, when and what sequences of learning events will occur, where the learning event lasts, the amount of time spent, and the resources and materials used."

4 CONCLUSIONS

The results of this research can be concluded that in-service training students of in-service Training of Primary School Teacher Education Program are categorized as quite capable in planning science lesson. Students' difficulties in preparing the implementation of lesson planning consecutively are planning assessment, planning learning scenarios, developing and organizing the material, and determining materials that is related to the applicable curriculum. It to be needed to develop a learning process that facilitate to increase student' ability in creating lesson plan.

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