Effective Approach of Authentic Task to Ability of Problem Solving and Self-Management for Student of Physical Education Using Action Research

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Abstract. The purpose of this study is to enhance the problem solving and self-management abilities of student teachers through individual and group authentic task. Preliminary results showed that the learning outcomes in high category, nevertheless problem solving and self-management abilities are still low and average categories (scattered at interval $40 \le N \le 65$). Initiative to improve this condition is needed. Action research is the alternative solution for that condition through planning, acting, evaluating, and reflecting. This study is allowed in 4 cycles. The acting step result with integrated discuss method, case study, and presentation including self-assessment for individual and group. This method was effective to enhance problem solving and self-management abilities. The final learning outcomes seen from the correlation between student self-assessment and lecture-assessment (r=0.19). Its means there are unidirectional relationship between the result of self-assessment and lecture- assessment. The Conclusion of the research was effective to enhance problem solving and self-management ability.

Key word: Authentic Task, Self-Assessment, Problem Solving, Self-Management, Action Research

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Introduction

The 21st century learning process requires the existence of at least four skills that should be possessed by student, namely creativity and innovation, critical thinking and problem solving, communication and collaboration (Alismail & McGuire, 2015). Creativity and innovation will be arise if someone has the critical thinking skills in problem solving, collaborate, and communicate. Critical thinking skills is Included into one aspect of skills is needed by every student in order not to fall behind in the competitive world of increasingly stringent (Djusmaini.dkk 2011; Festiyed. & Djamas 2016; Beachboard & Beachboard, 2010;).

Learning in higher education preferred to offer subject that can stimulate developing critical thinking skills in problem solving, collaboration, and communication. Physics evaluating development subject have been taken by graduate physical education teacher training college Padang (Now UNP), where the course is included in the compulsory subjects with 2 credits. On This course there are the main points of discussion were very useful for the assessment of the future of learning physics, students who attend this course are expected to have sufficient provision to carry out the duty as educators in assessing Physics learning. The lectures learning model that had been done was by discussion and presentations method. Discussion method is an effective method for creating a conducive learning either in small groups or large group in the education involving lecture (Philip et.al, 2011)..

The lecture on the first week is divided task proper topic in the RPS to be done personally in the form of his resume, the group task having a form papers and will be presented. The group task is the result of merging the idea of a group that includes examples of problem assessment conducted in the field. In the second week provides an overview of the study material to be analyzed. The next week, time to present group paper, in which each group gets a turn presenting 2 times. Research results on the two classes of teaching spread at intervals ($66 \le N100$), but for the assessment process of problem-solving and self-management ability on average is in the category of low to medium or is in the interval $45 \le N \le 65$ (Festiyed, Djusmaini Djamas: 2016).

Based on these findings it is possible to find an effective learning approach so as to improve the ability of students because some study materials have learned while at the undergraduate level. The hypotheses of the causes of not been optimal of the problem-solving and self-management connected to the task and assessment system in which the lecturers have not stimulate the student's ability. Those problems could be due to the process of assessment approaches in the learning not been optimal and assessment process in learning model no been not appropriate. The proper authentic task, assessment, and rubric is needed to the learning model.

The learning model developed is an integrating discussion, case studies and presentations method included optimize the self-assessment. The use of case studies will facilitate students to find an explanation of the phenomenon from a variety of sources in the field that the phenomenon and the problems describing of contextual life(Yin, 2003). The theory of learning identifies five dimensions of learning that are essential for the success of the learning process, it includes five dimensions: (1) Positive attitudes and perceptions about learning; (2) Acquiring and integrating knowledge; (3) Extending and refining knowledge; (4) Using knowledge meaningfully; (5) Productive habits of mind. Implementation self-assessment at least refers to the three of the five dimensions of learning above (Marzano et al, 1997; Scott, 2015; .

Self-assessment can affect to attitudes and a positive perception of learning (Ballester, 2014). Students engagement actively in the assessment process and in developing learning objectives of their own, will be building motivation and will be meaningful learning to them. The Meaningful learning is a pedagogical model as a reference for quality learning plan (Keskitalo, 2011; Howchatturat, 2014; Zheng, Huang, & Chen, 2012).

Self-assessment also expanded and refined the knowledge of the students because when they evaluate themselves, they have to analyze what they have learned in a deeper and more thorough. Critical thinking skills needed to be able to think and analyze what has been learned (metacognition). Metacognitive knowledge related to cognition and self-regulation in the form: (1) the perception and understanding of themselves as learners and thinkers; (2) analysis types of cognitive tasks that may be encountered; and (3) the realization of strategic knowledge, good processes and procedures, which are required to learn and think more effectively (Alexander, Schallert & Hare, 1991). Its Parallel with the research of Djusmaini Djamas & Festiyed (2016), by thinking and communicating the results of this in

mind, students are to expand and refine the quality level of knowledge for not only know and understand, but has reached the analysis, evaluation, and creative

Habits and students' ability to perform continuous self-assessment will generate productive habits of mind (productive habits of mind). One way to build this habit is to adopt these habits in the learning process. Learning through self-assessment is developed based on critical thinking skills. The ability aspects, namely: the ability to think critically in terms of problem solving and self-management ability (Bahr, 2010; Styron, 2014; Muchlisin, Susilo, Amin, Rohman, 2016).

The Indicators of problem solving ability consisted of: identifying the problems and gather relevant information to the issues, define the problems that will be addressed, evaluated various alternative solutions as well as sort, make decisions or take action based on pre-set criteria, the consequences of the decision taken, apply the solution decided upon and examine the results, and solve problems independently. Being the self-management ability is one of the non-technical skills, known as employability skills. Employability skills are a number of skills that can be used in everyday life and can be transferred in a variety of occupations and professions (Hager & Holland, 2006; Lowden et al., 2011). The Indicator of self-management consisted of : a sense of responsibility for the actions taken, making work plans systematically, implemented the work planning consistently, stay calm in the stressful situations, perform a self-evaluation and to seek improvements in order to improve performance, have confidence in the ability to complete the work, and manage various resources owned to produce the best work (Suarta, 2013).

Solving the problem is a basic human urge to be involved actively in changing and improving human knowledge to adapt to changes (Armstrong, 2012). According to the theory of Ausubel's learning, the problem solving is a special case of meaningful learning. Therefore, the aims of learning system to enhance the problem solving should be designed in such a way to promote meaningful learning. To engage in meaningful learning, students must identify the specifics of relevant concepts and relationships between those concepts. For example, identifying the meaning of the concept of force, mass and acceleration, and not just memorize word for word from the definition and substitute numbers into formulas like F = ma. Further discussion of the Ausubelian's principle applied to physics available elsewhere.

Stimulation of the problem solving and self-management required authentic learning and also authentic assessment. Authentic learning is learning that involves students in exploring real-world problems involving high-level thinking skills. Authentic learning in various disciplines are: 1) activities that involve real-world problems; 2) related to the investigation open, thinking skills, and metacognition; 3) Students are involved in social learning; 4) students are empowered to direct learning according to their own choice through the relevant project tasks; 5) improve the academic performance of students in science education (Audrey C, 2006; Apedoe, Walker and Steeves, 2006; Aina, Kola, & Langenhoven, 2015).

Authentic assessment requires a task to display the performance of learners, and an assessment criteria or rubric which will be used to assess performance based on the appearance of it authentic. Task is a task that asked students perform or display it considered authentic if: 1) students are asked to construct their own responses, not just choose from the available; 2) the task is a challenge that is similar (similar) faced in the (world) the real reality. Baron's suggests five criteria for authentic assessment task, namely: 1) The task is meaningful for both students and teacher.

- 2) The task was compiled with the students.
- 3) The task requires students to find and analyze information as well as draw conclusions about these matters.
- 4) The assignment asks students to communicate the results clearly;
- 5) The task requires students to work or perform (Marzano, 1997)

Self-assessment is a powerful technique for self-improvement (Ross & Bruce, 2007). The literature on self-assessment use the term 'self-assessment', 'Self-reflection' and 'self-evaluation'. (Andrade & Du, 2007). Contributions of self-assessment is the improvement of behavior and student achievement (Ozarslan & Ozan, 20016;). The weakness of the self-assessment are 1) various control of the student caused a decline in standards of assessment; 2) Allows for retrospective assessment, it mean that they may not remember what they were doing; 4) Students can not accurately assess the results of their work, 5) would provide more jobs for students that is considered boring and was considered unfair to them (Ross, 2006). How the implementation of self-assessment:

1) Teacher provides a rubric or examples of student work.

2) Students prepare a draft task and compare with a rubric that has been provided

3) Students use the feedback generated by their self-assessment to guide them to make corrective adjustments to their work (Andrade & Du, 2007).

Methodology of Research

Action research methods were selected in this study aimed to investigate which allows people to search for effective solutions for the problems encountered in everyday life (Stringer, 2007). Action research can be seen as a powerful methodology for reforming education. Research is very effective measures implemented to apply theory and practice (Bobrakov, 2014). Research carried out consists of four stages, namely planning, acting, observing, and reflecting, as image 1



Figure 1 Step of Action Research

The subjects of this research were student teacher from graduate of Physics Education program in UNP. Data was analyzed by a reflective and evaluative. Reflective analysis is an attempt to remember and reflect back an action that has been done. Reflecting was trying to understand the process, problems, and obstacles in strategic action. In this case the reflection analysis performed by considering the variety of perspectives that may exist and understand the problems that appear with obstacles. In this reflective analysis activities throughout the researchers gathered together to conduct a discussion. Discussions focused on the process of discussing what action was performed to find the problems and obstacles encountered in implementing the action. Then determined measurable anticipatory that can be done to improve further action. The result of reflection analysis will be discussed to evaluate the success rate of actions against the gains in learning lessons. The result of this action that further be used as input to determine further action.

The outcomes of action level indicated in the number using a scale of 1 - 5. Score 1 showed no performance, it followed by low levels of learning outcomes or very incompetent, while a score of 5 indicates a excellent performance indicated the outcomes level is very competent, the classification of the level of achievement of action as shown in Table 1.

	Table 1. The Category of The Level of Achivement	
Category	Interval	Rentang
1	Very Low	$0 \le N \le 39$
2	Low	$40 \le N \le 55$
3	Medium	$56 \le N \le 65$
4	High	$66 \le N \le 79$
5	Very High	$80 \le N \le 100$
5	Very High	$80 \le N \le 100$

Furthermore, the correlation test to determine the effect of learning outcomes of observations and authentic assessment reflection on the results of self-assessment is made of students. Correlation test

conducted with product moment correlation formula. Puth, et al (2014) states the product moment correlation formula as follows:

$$r = \frac{n\sum XY - (\sum X)(\sum Y)}{\sqrt{n\sum X^2 - (\sum X)^2} \left\{ n\sum Y^2 - (\sum Y)^2 \right\}}$$

Results of Research

The results of the research can be divided into four stages: preparation, implementation, observation and reflection. The preparatory stage of planning together with observers for: 1) Generate Plans Class Semester (RPS), Sheets assignment and marking rubric self-assessment, Sheets observation and Format notes field, self-assessment checklist that characterizes the model of action in the form of learning that enable students to solve problems and manage themselves through self-assessment. 2) Assign all students to find a solution theoretically and personally worked and collected every week. 3) Divide students into 7 groups are heterogeneous. Each group consists of three people, each assigned to: create a resume analysis of personal tasks and create a matrix group members resume the results of student assignment results the previous year and added the latest source; make a mini research development according yng problems derived from the topic and compared with the incidence in the field; And setting a percentage for seminar

Second, phase Implementation (Implementation) The researchers applied learning that enable students to present and discuss which group. During the process of assessment by step according Festiyed (2014), namely: (1) involve all components in determining the criteria of assessment, (2) make sure all students know how to use these criteria to assess their performance, (3) provide feedback on their popularity the results of the evaluation itself, and (4) refer them to develop their own goals and work plan next. The first step, determining the assessment criteria. Educator invites students establish assessment criteria. At the first meeting of the lecture is given socialization learning objective and brainstorm to establish learning outcomes and criteria that will be judged. The second step to make sure all students know how to use these criteria to assess performance. This criterion is equipped with how to achieve it. In other words, the assessment criteria are the product, while the process of achieving these criteria is monitored using the self-assessment checklist. Self-assessment checklist is developed by the nature of these goals and how to achieve it. The third step to provide feedback to the students based on the self-assessment result, in which will be rebuilt on the next task. The fourth step directs the students to develop their own goals and follow up plans in accordance with feedback in step three.

Before the lecture, all students are given the RPS and the module that contains study material for one semester. Students make groups followed by three people in each group and dividing the topic in RPS. Each student is required to resume student and group study materials and will present papers by the personal task of each group. The resume is getting from the topics that have been distributed and how the steps that must be done in groups and in the classroom using the self-assessment. Offering the cases aims to make students have the same initial understanding of the measurable discovery solutions and selfassessment procedures and assessment rubric. The case was further reviewed with the group stated in a paper to be presented. The process of making papers, presentations and discussions were conducted selfassessment for the improvement and refinement of the discussion to the next case. After the presentation and discussion of lecturers provide reinforcement concepts and steps of implementation self-assessment to students based on existing topics. The task and self-assessment results will be analyzed to determine the level of student understanding.

In the monitoring stage, some things that are monitored were the active engagement of students in the group, the critical thinking in terms of problem-solving ability and self-management ability as well as the learning outcomes of students in the form of dispute resolution results given the teacher. Monitoring activities more geared to assess the success of the learning process that has been done. In addition, monitoring activities aims to know the weaknesses that found in the learning process. The weaknesses that have been identified then used as input for the improvement of the learning process in the next cycle.

Preparation of student tasks carried out in four phases, namely: Phase 1 Identifying outcomes of students' final ability: Formulate a statement for learning goal and performance capabilities which everyone must know and can do. Phase 2, Choosing an authentic task: Analyze standards created, and analyze the task of solving problems that occur in daily life. Phase 3, Identifying Criteria for assignment: assignment criteria adapted to the indicators of the critical thinking abilities, expressed with clear, concise,

statement of behavior can be observed and written in language that is understood easily by students. Number of criteria for each task: limited only to the essential elements of a task (3-4), under 10), do not need to measure every detail task. Stage 4 Creating standard criteria or rubric (rubrics): using a holistic rubric, considering how well someone has to show its work as a whole. Sections can be understood as a scoring scale used to assess student performance on each criterion to specific tasks. Two main points made in each section, namely the outcomes level of performance criteria and each criterion. The criteria refer to the indicators of learning level.

The reflection Phase, observers do reflection and discussion on the process of implementation has been done. At this stage, researchers are evaluating the implementation of measures to verify the hypothesis of action. The verification results are reviewed and discussed to determine the Specific problems unsolved, analyze the causes of this, and look for weak spots actions taken. The assessment results were used as input to determine a plan of action in the next cycle. The results of problem solving ability can be seen from Figure 2.

According to Figure 2 can be seen that there is an increase problem solving skills result of performance of cycle 1 to cycle 4. Achievement of problem-solving skills in an average cycle-1 is 63.05, 65.96 cycle 2, cycle-3 72.42, and cycle-4 75.04. The highest achievement obtained in the 2nd indicator that defines the issues to be addressed. While the lowest for the achievement of all seven indicators in terms of solving problems independently. Further classification, the student number distribution for the indicator of problem solving for 4 cycles as in figure 3.



Figure 2 The Average Score of Problem Solving Ability Per Cycle



Figure 3. The achievement of problem solving ability

Based on the descriptive statistics, the general problem-solving ability of students can be increased through self-assessment, when compared to the state of the cycle of 37.5% in the moderate category and

28.1% in the high category, 62.5% in high category and 9.4% higher category at once high on the fourth cycle. Effects action to self-management ability showed in Figure 4.

Based on Figure 4 can be seen that there was an increase between the result of average selfmanagement has increased, although not significant. The achievement of self-management in the first cycle was 67.16, second cycle 70.00, 74.49 cycle III and IV cycles 8.81. The highest achievement indicators obtained at no 2, namely Make a work plan (learning) systematically. While achieving the lowest for the first indicator that is Responsible for the actions taken. Have confidence in the ability to complete the work (tasks lectures). Further classification of the distribution of the number of students for self-management indicator for 4 cycles as in Figure 5.

The descriptive statistics showed that generally the self-management ability at the end of the cycle in high category (59.4%) and very high (9.4%). Furthermore, the correlation test to see the correlation between authentic assessment by lecturers (Y) and self-assessment by the student (X) for the last cycle using the product moment correlation formula. The Results relationship self-assessment and lecture assessment in last cycle, such as Figure 6.



The Indicators of Self-Management

- 1. Responsible for actions taken
- 2. Creating a lesson plan systematically
- 3. Implementing lesson plan consistently
- 4. Be calm in the face of stressful situations
- 5. Self-evaluation and improvements effort to increase learning achievement
- 6. Belief in the ability to complete the work (tasks lectures).
- 7. Manage available resources to produce the best performance.



Figure 4. The Achievement of Self-management ability

Figure 5. The result of Self-management ability



Figure 6. The relationship between learning outcomes based on self-assessment and lecture assessment.

Based on Figure 6 showed that correlation between self-assessment (X) and lecturer assessment (Y) is obtained coefficient value is 0.19 and a coefficient of determination (r^{2} is 0.034). Based on the results of the analysis, it is known that there is a very strong and positive values among the learning outcomes of the observations and the value of reflection and self-assessment results (Grant, 2014).

Discussion

The Learning approach to enhance the problem solving and self-management of student teachers through the development of authentic tasks for individuals and groups and assessment emphasis on self-assessment, and effective for all indicators. From 7 problem solving indicator shows 4 indicators have reached good categories, while 3 indicators with very good category. Likewise for 7 indicator of the self-management ability show that 3 indicators have reached the very good category and the 4 indicator is still in the good category. The increase in the indicators is because students are trained find their selves root of the problem and seek developing alternative form of problem solving the weaknesses of the previous task to produce the best work the next. The task of the individual and the group gathered before and after the presentation as portfolio. The portfolio is assessed and reflected to see improvement process and problem-solving ability to manage themselves.

Self-assessment requires the direct involvement of students in integrating knowledge, skills and attitudes. Students organize their learning independently, make choices, select learning activities, and to plan how to use their time and resources learning. They have the freedom to choose activities to challenge, dare to take risks, make their own learning progress, and completing the desired objectives. Because of they can control of their learning, they can decide how to use the learning resources available to them inside or outside the classroom. Students who self-regulate their learning of the (self-regulated learners) in collaboration with other students to exchange ideas, seek help when needed, and provide support to their peers. Finally, self-regulated learners or students independently organize their own performance and evaluate the progress and results of their own learning. Parallel with the opinion of Allen & Velden (2005) which states in the self-assessment, individuals were asked to rate of their skill by themselves in different domain. Jonsson (2008) also declared authentic assessment can provide more valid data about the student teacher competence. The analysis result showed, as many as 68.5% of students demonstrated in the problem-solving ability in high category once, and as much as 80.0% of the students demonstrated the self-management in the high and very high category. On average, these results can be interpreted as an indication of the ability of employability skills of students in both categories. In line with the opinion of McMillan & Hearn (2008) which states self-assessment requires students assess their own work, based on the evidence and clear criteria, for the purpose of improving future performance.

Through self-assessment, students can see the advantages and disadvantages, to further these shortcomings become improvement goals. This is in accordance opinions Keskitalo (2011) through the improvement of the learning process, improvement of assessment can motivate and develop students' ability to apply their knowledge and skills to solving real problems, and make students more responsible for the process and the achievement of learning goals. By actively involving students in the assessment

process and in developing learning objectives of their own, students will awaken the motivation and learning process as something that has meaningful (Logan (2015).

Learning outcomes in the shape of designing self-assessment also showed results consistent with the problem solving ability of students. There are 71,3% of the students have a high category and very high category. These results have not been able compared with the decrease, because of only for one competence. Even though, 70% more students have higher and very higher category. It showing learning outcomes is suitable with the hoping. These results verify that problem solving and self-management instrument is valid. these also indicated the instrument can be used to evaluate the problem solving and self-management ability. However, the reliability of these instrument is still low (0,70). Nevertheless, the reliability component of problem solving is better than self-management. Assessment model was developed also focus on a basic competence and comprehensively because of carry out using analytical rubric. On this model, the assessment conducted on all indicators. The objectivity of the assessment also showed high result and made honestly by students. as many as 89% of the students assess themselves objectively and honestly.

Learning through self-assessment that was developed in compliance with the basic principles of assessment as disclosed by Brookhart (2003), the Hemispheric Project (2006) and Jonsson (2008), the principle of validity, reliability principle, focusing on competence, comprehensive, principles of objectivity, and the principle of educate. This model learning course provides a learning process to the students through self-assessment continues regarding student learning outcomes. Besides the self-assessment of personal and group tasks can increase the students engagement (Mandernach, 2015). The results of this research to be basic for improving students peformance in the future.

Conclusions

The students engagement in self-assessment, demanding they be more creative, learn to be honest, fair, responsibility, dare to criticize ourselves, discipline, improve the competence, confidence, improve concentration studied, using the time well, continuous improvement, enthusiasm / motivation to work . Thus students will be able to think critically identify the weaknesses and strengths of him. This model has fulfilled the assessment principles, namely the principles of validity, reliability, focus on competence, comprehensive, objectivity principle, and pedagogic principle. Based on the results concluded that the reflective of problem solving and self-management ability both categories. This study should be continued with the implications of implementation of authentic learning and assessment using control class, therefore the result can be differentiated.

Learning outcomes seen from the end of the correlation results of student self-assessment with the assessment of the lecturers obtained r = 0.19 meaning that the linear relationship between self-assessment of students with the lecture assessment. It can be concluded learning approach through authentic tasks as well as individual and group self-assessment effective to improve problem solving skills and self-management of student teachers.

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