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Effectiveness Learning Based On LKPD Asistance Problem to Improving

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Abstract: purpose of this study is to look at the effectiveness of LKPD-assisted problem-based learning model of creative thinking skills of learners. This research is a research development of Research and Development (R & D) developed by Thiagarajan, Semmel, and Semmel which covers the defining phase, design stage, and development stage. Research instrument using multi-staired double choice instrument that has been validated. Increased creativity of learners is determined based on the results of the N-Gain test and criteria for the assessment of creative thinking skills. The result of the research showed that there was an increase of creativity in the students, from 88 students who participated in learning 33 students received highly creative criteria and 55 students got creative criteria and from 88 students the average Gain score was 0.44. These results show that LKPD-assisted problem-based learning is effectively used to improve the creative thinking skills of learners in chemistry learning.

Keywords: problem-based, student's creativity

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I. Introduction

Education is one of the main pillars of future mangantispasi, education is always oriented on preparing students play a role in the future (Umar and La Sulo, 2005). Learning is a process of helping students to acquire information, ideas, skills, values, ways of thinking, and ways of learning how to learn. The learning process should really pay attention to student involvement. During this time, high school learning activities still emphasize the change of thinking ability at the basic level, yet maximize students' high-order thinking ability. High-level thinking is also very important for mental development and changes in the mindset of students so that the learning process is expected to succeed. One of the higher-order thinking skills that can be used to solve a problem is the creative thinking skills (Suparman and Husen). Chemistry requires not only the knowledge of facts principles, but rather finding out how the process of discovery. Chemical learning in high school aims to get productive, creative, innovative and affective people through knowledge of integrated attitudes, skills and knowledge.

Essential thinking skills to be developed in education are creative thinking skills (Chan, 2007). Creative thinking is a cognitive activity in finding solutions to solve a problem (Miswandi and Zubaidah). Creative thinking skills are part of the learning process to help students become successful learners, confident individuals and become responsible citizens so that it is important to develop in various subjects to help students develop creative and creative in solving problems (Cachia et al, 2010). Creativity is a very important skill to solve problems and generate new ideas (Zenobia, 2012, Arvyati, 2014), generate new ideas by combining, altering or adding to existing ideas (Anwar et al, 2012), using ideas, refine, analyze and evaluate ideas in order to improve and maximize creative effort (Piirto, 2011).

Objectives Students are trained to solve problems by using the problem-solving approach according to Russefendi (1988: 341) one of which is to increase motivation and foster the creative nature. In solving the problem, each student needs a different time. Explaining to reveal or capture the creative man should we use open (divergent) questions, questions that the answer can be more than an and can not be predicted from before. In addition, divergent questions require those who are asked to guess, hypothesize, check whether or not the hypothesis is true, review our solution thoroughly and draw conclusions. This is also reinforced by Silver (1997: 77) who says that using open issues can give students a lot of experience in interpreting problems, and may generate different ideas when associated with different interpretations.

Student worksheets that use problem-based learning model is packaged in the form of problem analysis and solving daily problems will make the students trained and in solving the problem of analysis (nasir, 2015). The learning outcomes obtained from the results of the problem to the students will provide a very strong retention force because the concept is built on its own experience, this is in line with Paulo Freire who said that

the problem-solving approach to students to be solved will give far better results and persist in long-term time rather than a verbal informati⁵ approach (Meier, 2012).

The way to practice students' creative thinking skills is to use problem-based LKPD, LKPD is designed⁵ asking questions that make students trained to think and solve problems using PBL model syntax⁵ to train students' creative thinking skills. Chemical learning using problem-based LKPD is expected to improve students' creative thinking skills. Therefore, the purpose of this study was to develop a problem-based learner workbook in improving students' creativity in indicators of flexibility and fluency.

24

II. Methods

This type of research is research development (Research & Development (*Research& Development / R&D* developed by thiagarajan, semmel and semmel (2010). Modified into 3 stages namely Deffine, Design and Develop.

The sample in this research is 88 students in West Lombok and follow the learning of Chemistry. Data analysis technique used is simple quantitative data descriptive analysis technique, that is showing result of problem-based LKPD development in improving creative thinking skill. And to see the effectiveness of the product used in this study is problem-based LKPD that is by looking at the difference in value of postes and pretes with the N-gain formula used by Cheng (2014).

$$N\text{-gain} = \frac{S_{\text{post}} - S_{\text{pre}}}{S_{\text{max}} - S_{\text{pre}}} \times 100 \% \text{ By Criteria}$$

Table 1 Criteria Skor Gain

9 asifikasi skor Gain	Kategori
$0.7 < g \leq 1$	High
$0.3 < g \leq 0.7$	Medium
$g \leq 0.3$	Low

III. Result And Discusion

Result

LKPD development is done by 3 stages of define, disaign and develop. Define or define stage involves the activity of determining the teaching materials in the form of LKPD needed, the result of the defining stage is to constr⁴ problem-based LKPD prepared with the stages of problem-based learning model which contains questions that can⁷ gain students in creative thinking, learning instrument made using the choice double stratum according to the indicators of creative thinking thinking, in this study the indicators used are indicators of flexibility and⁸ loquence.

The next stage is the design stage or design stage, at this stage get res⁶ts in the form of LKPD product design and assessment instruments that have characteristics using the syntax of problem-based learning model that can improve the creative thinking skills on indicators of flexibility and fluency. Figure 1 shows how the initial display of the LKPD is created



Figure 1. LKPD Initial View (Home Page)

The next stage is the stage of development at 21 stage is obtained is the result of increasing the value of pretest and posttest followed by the calculation of N-gain test. Effectiveness test is conducted to determine the effectiveness of LKPD used in improving learning outcomes and creative thinking skills of learners. The results obtained from 88 learners who followed the learning is 0.44 and belong to the moderate category ($0.3 < g \leq 0.7$). These results prove that LKPD is used quite effectively in improving creative thinking skills.

Tabel 2 The Results of Average Score of N-Gain Test

Number of student	Tes	the average value of learning outcomes
88	Pretest	33,95
	posttest	64,52
	N-gain	0,44

The next result is the analysis of creative thinking skills of learners from 88 participants

Tabel 3 Average Scores of Creative Thinking Skills

Jumlah	Indikator KtBK	Tes	Rata-rata Nilai Tes
88	Fluency and flexibility	Posttest	64,52

In table 2, the average score of creative thinking skills on the aspect of eloquence and flexibility for the number of learners as much as 88 is 64.52 and classified as creative. Table 3 shows the analysis of the classification of creative thinking skills of learners.

Tabel 3 Average Scores of Creative Thinking Skills Learners

Tingkat KtBK	Average	Persentase
Very kreatif	73,80	35,22 %
Creative	59,30	62,50 %

IV. Discussion

This research in addition to knowing the feasibility of the developed device is also intended to determine the effectiveness of problem-based learning tools in improving learning outcomes and improve creative thinking skills of learners. The learning process begins with students doing the pretest. The pretest issue is intended to determine the initial ability of learners on acidic and basic materials prior to using problem-based LKPD. After pretest learners are given an explanation of the problem-based learning tool, which later will learn with problem-based learning model and use the learner sheet that later on the end of learning by using problem-based defensive tools will do a posttest problem to know the achievement of learning outcomes and thinking skills creative.

Analysis of the increase in the average score of pretest and posttest after applying the learning by using the formula of N-gain obtained an increase value of the three SMAs of 0.44 which means the increase in the average score of pretest and posttest is in moderate category with the value for the moderate category is ($0,3 < g \leq 0,7$). In other words problem-based learning tools are quite effective in improving learning outcomes of learners. These results are in line with research conducted by Mussani (2015), the N-gain test can be used as a test to see the effectiveness of a teaching material.

The average value of N-gain obtained shows that the problem-based learning tools developed are still quite effective and have not reached a high value. Effective work associated with the degree of achievement of objectives and functions of the product (Sugiyono, 2015). The result of creative thinking skill analysis is get the average result of 64.52 creative chemical thinking included in creative category. The result shows the problem-based learning tool can improve the creative thinking skill of the learner. Improved learning outcomes and creative thinking skills of learners because the tools developed using problem-based learning model presents the problem as the context and driving force for learners to learn to solve problems and analyze problems (Kurniawati and Amarlita, 2013). LKPD developed contains models designed to train students' skills in solving problems and make learners become more creative in dealing with a problem. The problem-based learning model in this tool is applied in learning that emphasizes the learner to be able to solve problems presented through various strategies and tactics, so that later can make learners have creative thinking skills.

V. Conclusion

Based on the results of the study obtained a product in the form LKPD dikembangkan by using effective problem-based learning model used to improve the creative thinking skills of learners

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