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DEVELOPMENT OF LEARNING DEVICE OF EMPOWERMENT THROUGH THINKING NATURAL SCIENCE LEARNING IN ELEMENTARY SCHOOL

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Key Words
Learning Device, science-biology, PBMP, Cooperative strategy

Abstract
The objectives of this study were to: (1) develop learning device for questioning empowerment thinking (PBMP) combined with cooperative strategies of TPS types and NHT types in science subjects in primary schools; (2) to know the different understanding of students' science concepts by applying the learning of PBMP, PBMP.TPS, PBMP.NHT and Conventional Strategy; (3) know the consistency of PBMP applications, PBMP.TPS, PBMP.NHT and Conventional Strategies. This research method: (1) research and development method to develop learning device; and (2) quasi experimental study to know the effect of applying learning tool to understanding student biology concept. To collect data using the science-biology concept test. Hypothesis test using covariance analysis technique (Ancova). The results of the research are: (1) This research produces learning device consisting of syllabus, PBMP learning plan, PBMP.TPS and PBMP.NHT. Learning device have the potential to improve understanding of science concepts in elementary schools in Mataram; (2) There is a significant difference in understanding the concepts of students following PBMP, PBMP.TPS, PBMP.NHT and conventional learning strategies

INTRODUTION

Based on the results of theoretical studies and elementary science teaching survey conducted in Mataram, necessary innovations empowering learning-oriented thinking skills of students in a planned addition to understanding science concepts better. Empowerment of students 'thinking skills can be done by implementing a learning strategy that potentially empower students' thinking skills. Learning strategy referred to them are learning Thinking Through Empowerment Question (PBMP), cooperative learning Think Pair Share (TPS), and cooperative learning Numbered Head Together (NHT).

Corebima report (2005), stating that the results of research in elementary, middle, and high school, learning strategy has been shown to significantly able to develop students' thinking skills and understanding of science concepts. Anggraini (2016) states that the Natural Sciences (science), contains not only about understanding the concepts and principles, but science also deals with how to

find a concept that is carried out systematically and scientifically. Listiana (2013) entered the 21st century science and technology development is very rapid, and information easily spread throughout the country in various parts of the world. The consequences of globalization development, we are faced not only the challenge, but also opportunities. That is, in this global era we have the opportunity to improve the lives of the people and the nation of Indonesia. One of the necessary capital in the face of this global era is the availability of qualified human resources.

The results of the study reported that the application of learning strategies PBMP and TPS can improve students' learning activities in asking and answering questions, and to improve science learning outcomes in MIJS Malang (Zubaidah, Mahanal, and Mulyati, 2005). Meha and Corebima (2005) reported that the application of PBMP in biology learning strategies can improve learning outcomes and reasoning abilities of students. The results of the study in middle school biology teaching with PBMP strategy combined with a cooperative strategy has reportedly been giving contribution on improving reasoning skills and student learning outcomes. On the basis of research results in the Junior I Salahuddin Malang, it was reported that a joint strategy and NHT PBMP empower potentially higher thinking skills and learning outcomes compared with PBMP only (Corebima, 2005). The research was supported also by the results of research on biology learning in SMPN 18 Malang which proves that the application of PBMP together with cooperative strategy models jigsaw indicate a relationship between the ability to think critically, develop life skills, and student learning outcomes (Corebima, Jarrotul, & Indrawati (2005).

Results of research Hasan S et al, (2016), the use of cooperative learning model of Student Teams Achievement Division (STAD) with the material of the ecosystem, as described in the results section, that the learning outcomes of junior high school 6 Bibinoi have increased. The results of students in the first cycle, it is known that the 20 students who took the tests end, only five people or (25%), which reached KKM (Criterion Complete Minimal), while 15 students, or (75%) did not reach KKM (Criterion Complete Minimal). Similarly, the research results of simple regression analysis proves that there is a positive correlation between thinking skills high on the cognitive learning, whether it is the control class (conventional learning strategies) as well as the treatment classes (cooperative learning strategies: STAD, TGT and STAD + TGT) , Based on the regression line patterns indicated that the treatment classes, be it in a class with cooperative learning strategies STAD, TGT, or STAD + TGT; positive relationship between the skill of high thinking skills and academic achievement of students meant that the increase in high-order thinking skills followed by an increase students' academic achievement of learning outcomes (illustrated in the above regression line value of zero).

These results are in accordance with the facts on the ground that all students are treated cooperative learning strategies have increased related metacognition skills, critical thinking, and cognitive learning outcomes. positive relationship between the skill of high thinking skills and academic achievement of students meant that the increase in high-order thinking skills followed by an increase students' academic achievement of learning outcomes (illustrated in the above regression line value of zero). These results are in accordance with the facts on the ground that all students are treated cooperative learning strategies have increased related metacognition skills, critical thinking, and cognitive learning outcomes. Positive relationship between the skill of high thinking skills and academic achievement of students meant that the increase in high-order thinking skills followed by an increase students' academic achievement of learning outcomes (illustrated in the above regression line value of

zero). These results are in accordance with the facts on the ground that all students are treated cooperative learning strategies have increased related metacognition skills, critical thinking, and cognitive learning outcomes. Cooperative learning type STAD is a cooperative learning where students are divided into groups small in receiving material and completing tasks learnin (Rumansyah, 2016).

According Langrehr (2006), the results showed that the students' learning outcomes improved significantly after they are trained with specific thinking skills. Low student's thinking ability may be caused by the applied learning strategies teacher in yet oriented to empowering thought, and only emphasizes the understanding of science concepts. Through SBC 2006 has recommended to the teachers to be in the planning and science learning activities they are expected to develop students' thinking skills in addition to understanding the concepts of science (BSNP, 2006b).

Learning with PBMP strategy, TPS, and NHT that gives an opportunity to the students to think in answering questions or completing the tasks individually or in groups. Furthermore, the students are given an opportunity for reflection about the answers or ideas presented in both the discussion and classroom presentations. This activity gives students the opportunity to know the lesson material that have been known and the unknown. Thus, learning science with PBMP strategy combined with TPS type cooperative strategy and NHT potentially empowering students' thinking skills. To that science teachers need to design and implement a learning-oriented to the empowerment of students' thinking skills.

Through this research has developed a learning device of empowerment think through the question (PBMP) combined with TPS strategy and NHT type cooperative for elementary science teaching. The device is then implemented to determine its influence on the understanding of the concept of science-biology grade elementary school students in the city of Mataram. According Haerullah (2012) that the application of integrated TPS PBMP strategy can improve students' metacognitive skills experimental class for this strategy gives students the opportunity to think about the answers and evaluate the answers together on stage think and share. While on stage pair, students are trained to communicate on finding a solution that's best shared with friends. Learning patterned TPS combined PBMP more potential to increase students' metacognition skills than conventional strategies. No influence of ethnicity on metacognition skills, but the results of LSD test indicated differences between ethnic students' metacognition skills.

Jamaluddin research results (2009) show that learning strategies PBMP, PBMP.NHT, and strategies Conventional significant effect on students' metacognitive skills. Students who study with a mean score PBMP.TPS strategy skills metacognitive higher than students who studied with PBMP strategy, PBMP.NHT, and Conventional. Ability student's high academic skills mean metacognitive score higher than students Low academic inability. Interaction PBMP strategy, PBMP polling, PBMP-NHT, and Conventional and academic capabilities facing significant effects of metacognitive skills of students. Students all low academic learning inability with strategy PBMP learning.

METHOD

Developed learning device consists of a syllabus, lesson plans, and worksheets. Development of the device refers to the procedure of 4-D model of the development of Thiangarajan, and Semmel Semmel (in Abraham, 2002; Trianto, 2007). The model is composed of four stages, namely "Define, Design, Develov, and Disseminate" which translates to the stage of defining, designing, development, and dissemination.

At this stage of analysis pedefenisian standards and basic competencies to limit the subject matter SCIENCE grade V Semester I

developed the device. Key steps in this stage is the analysis of the curriculum which includes analysis and analysis of students' assignments. The curriculum imposed on SDN is used as a research site uses Unit Level Curriculum (KTSP), 2006.

The design phase is to prepare the prototype device developed learning. The initial step of this phase is determined learning device format. The results obtained in this stage is the preliminary design of the learning device that includes syllabus, lesson plans, and worksheets. The format used is adapted to the format of the elementary school where the study. From the Survey results indicate that the developed learning devices format based on the format suggested in the implementation of SBC 2006. This is in line with that recommended by the Head of Education Department of Mataram. The format is composed of syllabus and lesson plan format. For elementary education unit level in Mataram there are no schools that are able to develop their own KTSP.

The development phase is to produce learning devices that have been revised based on feedback learning experts, teachers grade elementary school and legibility test results by the students. Learning experts as validators who have provided input to the learning device is Prof. Dr. AD Corebima, M.Pd., Prof. Dr. Muslim Ibrahim, M.Pd. and Prof. Dra. Herath Susilo, M.Sc. Ph.D. The results of the assessment of learning experts considered representative for the reference in deciding that the device has been qualified learning content validity. The results of the expert assessment mereko-mendasikan that the learning device can be used after some revisions based on the suggestions of the validator.

Suggestions of validator for lesson plan can be summarized as follows: 1) Teachers who strived for implementing learning skilled in developing and directing questions during the learning activities. 2) In order to consider the suitability of the backing material with the allocation of time available for science. So that the subject matter can be resolved in accordance with a predetermined time. 3) indicators of achievement of learning outcomes tercan-tum in the LESSON PLAN should be measured with test items that exist on the grating tests. 4) In writing questions kaedah-kaedah note essay writing.

Suggestions and corrections to SAS are: 1) The questions SAS still need to be developed in accordance with the nature PBMP. Strive to develop the questions relating to the question of the next question. Thus the answer to the first pertnyaan can be found by students after answering questions. 2) Formulation of questions on worksheets tailored to the abilities of elementary school students. Each question pursued unambiguously. 3) Note the work procedures which will student in SAS. Strive association with students of environmental circumstances. 4) For the risky activities done in class need tighter supervision by teachers, considering the elementary students were still happy to play.

Results of the assessment of learning devices by elementary school teachers take precedence in the allocation adherence to and compliance with the time available for science. Based on the experience of the teachers that the device can be implemented according to the time available. SAS legibility test carried out in class V SDN 43 Mataram. Researchers with the teacher asked directly to students about the legibility of working procedures, questions, and device-materials that can be understood or not understood. From the results of teacher assessment and test readability by revising the student learning device. Learning the syntax keterlaksanaan trials conducted by the teacher to determine the effects-tivitas device. Friendlies This keterlaksaan directly used as an exercise for teachers in implementing these devices,

The final stage of the stages of software development is an implementation stage device that has been revised and tested during the development stage of the classes of

experiments on a wider scale. Because of the limitations of time and cost, especially for this stage is not carried out in this study.

RESULTS AND DISCUSSION

1. Learning Device

Learning devices developed through this research consists of the syllabus, lesson plan (LESSON PLAN), and student activity sheet (SAS) PBMP. The result of the development is described as follows.

a. Syllabus

Syllabus is a lesson plan on a subject with a particular theme that includes standards of competence (SK), basic competence (KD), the standard material, indicators, assessment system, time allocation, and learning resources. Syllabus developed by each educational unit berdasarkn curriculum in force. Syllabus development procedures in this study based on KTSP 2006. The syllabus development steps are: (1) fill out an identity column, (2) reviewing and analyzing the competency standards, (3) study and define basic competencies, (4) identify the standard material, (5) designing learning experiences, (6) to formulate indicators of achievement of competence, (7) determines the type of assessment, (8) determine the allocation of time, and (9) to determine the source of learning (BSNP, 2006b).

The results of this study have developed three types of syllabuses namely learning syllabus PBMP, PBMP.TPS learning syllabus and learning syllabus PBMP.NHT. For conventional learning syllabus follows the syllabus developed by the SDN 23 Ampenan conducting science learning with conventional learning strategies. The difference lies in the syllabus of each component of students' learning experiences that are tailored to the syntax of each learning strategy. The syllabus is then used as a reference for preparing lesson plan.

b. Lesson Plan

The learning implementation plan is a plan that describes the learning procedures and management to achieve one or more of the basic competencies described in the syllabus. Thus lesson plan is essentially a short-term planning to predict or project what will be the teacher during the learning activities (Mulyasa, 2006). Referring to the KTSP 2006, development lesson plan procedure consists of: 1) fill out the identity of the subjects; 2) menen-tukan allocation of time required for a meeting that has been set; 3) set standards and basic competencies, as well as an indicator in accordance with the syllabus has been prepared; 4) formulate learning objectives based on standards and basic competencies, as well as indicators that have been determined; 5) identifying the standard material based on the subject matter contained in the teaching learning; 6) establish strategies and methods to be used; 7) formulate learning steps consisting of initial activity, the core and the end of the activity; 8) determine the relevant learning resources; and 9) sets the criteria for assessment, observation sheets, and scoring techniques. lesson plan that have been developed in this study consists of lesson plan with PBMP learning strategies, PBMP.TPS, and PBMP.NHT. While the lesson plan with conventional learning strategies follow the lesson plan developed by the SDN 23 Ampenan where the conduct of research with conventional learning strategies. Results lesson plan development consists of an PBMP, PBMP.TPS, and.NHT

c. Student Activity Sheet (SAS)

Student activity sheets (SAS) is a reference for students in conducting learning activities to achieve learning goals. In the application of learning strategies PBMP alone or combined with other learning strategies (Cooperative) is always accompanied by the submission of questions prepared in writing in SAS-PBMP. SAS referred contains learning activities

undertaken by students in each learning activity. The stages of such activities include: 1) providing, 2) do, 3) thinking / summarize, 4) assessment, and (5) directives. In SAS PBMP all students 'learning activities are arranged in the form of imperative sentences and questions designed to train students' thinking skills.

Learning devices generated in the study have been validated by learning experts, fifth grade elementary school teacher, and a readability test SAS by students. Learning experts provide corrections and notes about the validity of the content of the learning device. Master class V SD provides feedback regarding the suitability of time learning science in elementary school, adherence to and compliance with karakteristeristik elementary students. Then test readability SAS by fifth grade students of SDN 43 Mataram.

Results of assessment of learning devices for syllabus and lesson plans: 1) in accordance with KTSP 2006, 2) can be used to achieve the indicators of student learning outcomes, 3) can be used to achieve basic competence, 4) in accordance with the learning syntax PBMP, PBMP.TPS, and PBMP .NHT, 5) the language used is quite clear, and 6) in accordance with the elementary science teaching time available. As for SAS, the assessment results indicate that 1) the stages of activities in accordance with the learning PBMP, 2) working procedures and questions in SAS clear enough for fifth grade students of elementary school, 3) relevant to achieve basic competencies and indicators of learning outcomes, 4) can used to train students' thinking skills, 5) to encourage students to make observations, science demonstrations and experiments in the classroom and the student environment,

2. Consistency Test Results Application of Learning Strategies PBMP, PBMP.TPS, PBMP.NHT and Conventional Learning Strategy.

Test the consistency of the application of learning strategies aimed to determine the consistency of the application of any learning strategy for the implementation of experimental studies in the fifth grade at each elementary school where research in Mataram. Consistency of application of any learning strategy is assumed to have an impact on the ability of students' thinking and understanding of the concept. Thus, the consistency of the application of learning strategy depends on the ability of teachers to teach and the learning process of the student. A statistical technique used to test the consistency is alignment analysis techniques and crush regression line. For the purposes of this analysis refers to the acquisition of thinking skills score (x) and scores understanding of the concept of (y). Scores Understanding the concept consists of pre-test score, midle-test score and post-test scores. Similarly score consists of students' thinking skills pretest score, midle-test score and post-test scores. Consistency test results were as follows.

a. Consistency Test Results Application of Learning Strategies PBMP

The test results consistent implementation PBMP learning strategy can be seen in Figure 1. From the results of the regression analysis using SPSS for windows computer assisted obtained regression equation:

y1 (pretest) = - + 34.028 0,2652X r2 = 0.1472;
y2 (Midletes) = 0,2164X + 55.737 r2 = 0.079;
y3 (post-test) = 0,2775X + 53.007 r2 = 0.0686.
y = understanding of the concept and x = thinking skills

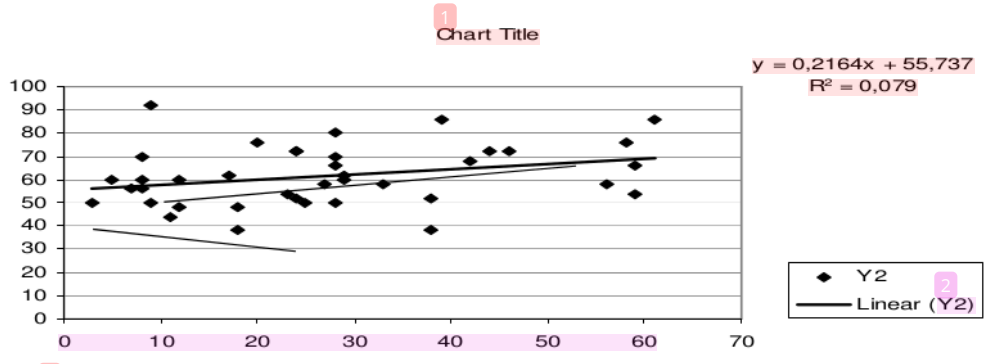

Figure 1. Results of Alignment Analysis and Regression Line Coincidence on the Application of Learning Strategies PBMP.

From the regression line of the obtained results: Ypra & ymid: not parallel; Ypra & Ypasca: alignment. Ymid & Ypasca: parallel and coincident. From the analysis of the regression line equation can be obtained information that the regression line Ypra & ymid misaligned, Ypra & Ypasca also not parallel. This means that the application of learning strategies PBMP not been carried out consistently from the beginning until the end of learning. Further regression line on ymid & Ypasca parallel but coincident. This shows that the learning process does not increase significantly. From the analysis of alignment and Coincidence the regression line can be concluded that the application of learning strategies PBMP can not be done consistently for research activities.

b. Consistency Test Results Application of Learning Strategies PBMP.TPS

The test results consistent implementation PBMP.TPS learning strategy based on a regression analysis of the scores of thinking skills and understanding of the concept of the pre-test scores and post midle-test.From the analysis of the data obtained regression line as follows:

Y1 = 0,2987x + 38.135 r2 = 0.108;
Y2 = 0,7469x + 39.18 r2 = 0.4573;
Y3 = 0,4784x + 42.22 r2 = 0.2577.

Based on the equation of the line can be determined alignment and Coincidence regression line in Figure 2 as follows:

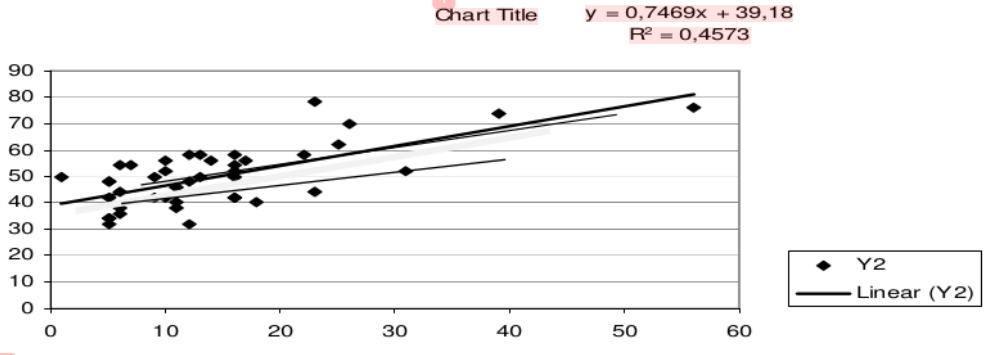

Figure 2. Alignment Analysis and Regression Line Coincidence on the Application of Learning Strategies PBMP.TPS

From the regression line in Figure 4.6 The obtained results Ypra, ymid,: alignment. Ypra & Ypasca: parallel and not coincident; Ymid & Ypasca: No parallel and not coincide.This means that the application of learning strategies consistent PBMP.TPS only at the beginning and towards the end of the lesson. However, the learning process increasing, although the middle of the semester occurred PBMP.TPS inconsistent implementation of learning strategies. This is presumably because the learning activities in elementary school did not last regular sebagaiman for their activities during the fasting month of Ramadan worship. From the analysis of the alignment test and Coincidence the regression line can be concluded that the implementation of learning PBMP.TPS semesters beginning and end can be implemented consistently. However, in the mid-term implementation of learning less consistent.

c. Consistency Test Results Application of Learning Strategies PBMP.NHT

From the results of regression analysis regression line: for the application of learning strategies PBMP.NHT as follows:

Y1 (pretest) = 0,4842x + 34.482 r2 = 0.3357

Y2 (midle-test) = 0,7804x + 35.34 r2 = 0.2403

Y3 (post-test) = 0,9764x + 24.689 r2 = 0.4693.

Based on the regression equation can be known alignment of regression line on the application of learning strategies PBMP.NHT as shown in Figure 3 below:

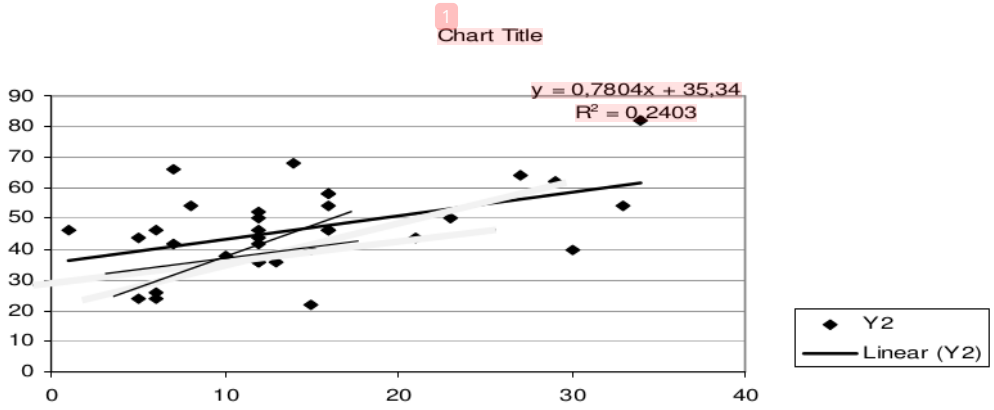

Figure 3. Alignment of regression line on the application of learning strategies PBMP.NHT

From the regression line of the obtained results Ypra, ymid & Ypasca not parallel. This means that the application of PBMP.NHT learning strategy can not be implemented consistently. From the equation of the line at the Y1, Y2, Y3 (linear) on average showed an increase in the activity of learning from the beginning of the semester until the end of the semester. From the analysis of alignment and Coincidence the regression line can be concluded that the application of learning strategies PBMP.NHT not been consistent in the beginning of the term, mid-term, at the end of the semester. However, after the mid semester of learning activity showed a tendency to be consistent.

d. Consistency Test Result Conventional Learning Strategy Implementation

The consistency of the test results obtained by regression line based on the scores understanding of concepts and thinking skills of students as follows:

Y1 = 0,4225x + 37.465 r2 = 0.1667;

Y2 = 0,5156x + 45.932 r2 = 0.2787;

Y3 = 0,782x + 55.843 r2 = 0.3292.

Based on the regression equation obtained alignment and Coincidence overview of the regression line of the application of conventional learning strategies for research activities are presented in Figure 4 below:

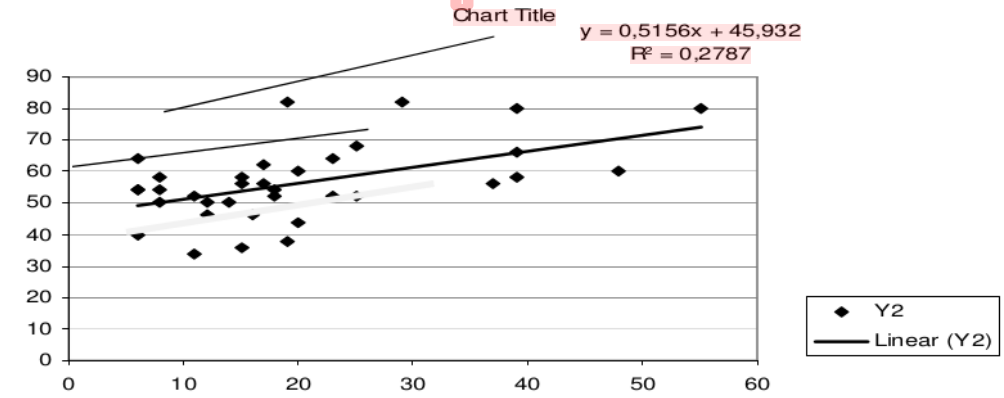

Figure 4. Alignment of Regression Line on the Application of Learning Strategies Conventional Learning Strategy Implementation.

From the regression line and Figure 4.4 shows that the regression line Ypra, ymid & Ypasca: parallel and not coincident. This means that the application of conventional learning strategies for research activities consistent from beginning to end of the semester. From the analysis of alignment and Coincidence the regression line can be concluded that the application of conventional learning strategies can be applied consistently from the beginning until the end of the semester for research activities. Based on the test results consistent implementation of learning strategies at each elementary school is a learning strategy PBMP, PBMP.TPS, PBMP.NHT, cannot be implemented consistently. Conventional learning strategies can be applied consistently from the beginning until the end of the semester during experimental research activities.

3. Effectiveness of learning devices on mastery of students' natural science concepts

Descriptive analysis of students' understanding of the concept of data score obtained by the mean score of pretest and post-test scores mean. These data are classified in the category of very less, less, medium, fine, and very good. In the mean scores of pre-test mean score of understanding of the concept is in the category of less than a score of the mean score of a combination of strategies PBMP.NHT-AT, Conventional strategies and combinations of strategies Conventional-AT in the medium category. For the post-test mean scores of students' understanding of concepts categorized medium, good and excellent. Mean post-test scores were categorized as moderate is the mean score students' understanding of the concept of strategy PBMP.TPS, PBMP.NHT, students of high academic ability, a combination PBMP-AR, the combination PBMP.TPS-AT, a combination PBMP.TPS-AT, Combination PBMP.NHT -ar, and students' low academic ability. Mean post-test scores are categorized either PBMP strategy, combined PBMP-AT, a combination PBMP.NHT-AT, a combination PBMP-AR, the combination PBMP.TPS-AT, a combination PBMP.TPS-AR, and

combinations PBMP.NHT-AR. Mean post-test scores either category is a strategy PBMP, Conventional strategies, academic ability scores, scores low academic ability, a combination PBMP-AT, a combination PBMP.NHT-AT, and the combination of Conventional-AR. Average mean score very well on the post-test category only score of the combination of Conventional-AT. Data mean scores of pre-test and post-test showed that all the pre-test mean score increased after the post-test. Mean scores were increased understanding of the concept of the category of less high enough on the pretest be good at post-test category is the mean score students' understanding of the concept on a combination of strategies PBMP-AT (up 55.18%),

PBMP learning strategies, PBMP.TPS, PBMP.NHT, and Conventional significant effect on students' understanding of science concepts. This means that There are differences in understanding the concept of science students as a result of the implementation of the strategy PBMP, PBMP.TPS, PBMP.NHT, and Conventional. Differences in mean scores of students' understanding of science concepts at every learning strategies are: 1) The strategies differ significantly from the strategy PBMP PBMPTPS, PBMPNHT, and Conventional; 2) Strategies differ significantly from the strategy PBMPTPS PBMP, Conventional, and did not differ significantly with PBMPNHT strategy; 3) Strategies differ significantly from the strategy PBMPNHT PBMP, Conventional, and did not differ significantly with PBMPTPS strategy 4) Conventional Strategies differ significantly from PBMP strategy, PBMPTPS, and PBMPNHT. From the difference in mean score was found that students who studied with conventional strategies mean gain score higher understanding of science concepts and significantly different with a mean score of understanding science concepts students learn PBMP strategy, PBMP.TPS, and PBMP.NHT. the results of similar studies have been conducted by Ekoningtyas (2013) who found that there was no influence strategies against metacognitive skills, creative thinking skills, understanding concepts and social attitudes among students by learning strategies TPS + PBMP with given multi-strategy learning , (2) there is an influence on the retention of understanding of the concept among students by learning strategies TPS + PBMP with the by multi-strategy. The increase occurred in the classroom TPS + PBMP and multi-strategy learning class.

PBMP strategy of learning syntax, PBMP.TPS, and PBMP.NHT more likely to improve thinking skills and understanding of science concepts students compared with conventional strategies. This is because in all three learning activities that strategy when implemented properly can improve students' learning activities that will impact the learning outcome or understanding of science concepts. This is consistent with the results of Maududi (2002); Zubaidah, et al (2005); which proves that the strategy PBMP and PBMPTPS can improve cognitive learning outcomes and student learning activities.

Based Corebima report (2005), strategy and NHT type cooperative TPS has been applied together with PBMP on learning research biologist at some junior high schools in the city and Malang. The results showed a positive contribution to thinking skills, life skills and biology student learning outcomes. But the results of this study found that the mean score of understanding of the concept of science students who studied with conventional strategies differed significantly higher and the mean score of students who study with PBMP strategy, PBMPTPS, and PBMPNHT. The findings of this study can be caused by several things including; of the learning process, and of syntax learning strategies.

Of the implementation process of learning can be seen from the observation of teaching and learning implementation consistency of test

results. The results of observations of learning keterlaksanaan reported that learning can be implemented in accordance with the syntax of individual learning strategies. The test results turned out to be a learning process consistency PBMP strategy, PBMPTPS, PBMPNHT, can not be implemented consistently in science learning during this research activity. Whereas conventional strategies can be implemented consistently. This can be caused by factors of students 'learning habits, habits of teachers' teaching and learning time factor.

Factors of study habits of students; before the implementation of the strategy PBMP, PBMPTPS, and PBMPNHT in science teaching students usually obtain the teacher's explanation at the beginning of learning and writing conclusions of the study at the end of learning. While the implementation of learning PBMP, PBMP.TPS, and PBMP.NHT, teachers are not allowed to explain and summarize the results of learning. Both of these should be done by the student in accordance with the principles of learning that is based on the strategy PBMP Konstruktivistik that the constructivist theory-based learning students are guided to be able to construct their own knowledge is not given by the teacher (Rustaman, 2005).

Changing patterns of this study requires considerable time and yet quite within one semester. Students and teachers need adequate time to adjust to the learning patterns and the pattern of teaching in the implementation of strategies PBMP, PBMPTPS, and PBMPNHT. Furthermore, when examined from time to learn the SCIENCE which is only 3 hours per week (3 X 35 min) in the implementation of strategies PBMP for demonstration and experimental activities are not sufficient for one meeting in the classroom. This led to the stages of learning can not be implemented in accordance with the learning syntax. Stages of learning that has not been completed at home each group of students. This will have an impact on the acquisition of the concept of science students who are not well.

To give an explanation in terms of syntax learning of the findings of the study should be presented again syntax learning strategies respectively: 1) Syntax learning PBMP (Sutomo, 2005), is (a) Introduction, (b) provides, (c) did, (d) thinking, (e) evaluation, and (f) landing. 2) Syntax PBMP.TPS learning (Corebima, 2005): (a) providing PBMP worksheets on students, (b) the implementation of the lab / demonstration by a heterogeneous group, (c) the workmanship SAS-PBMP individually (Thinking), (d) discussion pairs (pairing), and (e) share (sharing) in the form of a class presentation. 3) learning syntax PBMP.NHT (Makhdum, 2005): (a) the numbering of the students in the group (Numbering), (b) submission of the question in the form of SAS-PBMP (Questioning), (c) thinking together find answers on worksheets PBMP (Head together), and (d) the provision of answers (Answering). 4) The syntax is based on a survey of conventional learning science teaching elementary school in Mataram as follows: (a) the delivery of the subject matter, (b) the filing of cu-nyaan, (c) discussion group, and (d) formulation of conclusions.

PBMP strategy of learning syntax, PBMP.TPS, and PBMP.NHT emphasizes the empowerment of thinking skills of students, there is no learning stages that intentionally provide opportunities for students obtain an explanation of the subject matter teachers. Then the end of the lesson teachers are not writing the conclusion of the subject matter that needs to be mastered by students. Whereas in conventional learning strategies students are conditioned to be able to master the subject matter. It can be learned from the learning activities at the stage of presentation of the subject matter and knot-right stages of learning outcomes at the end of the learning activity.

The second step of the learning activities is one thing that has given the opportunity for

students to master the material science. For elementary students both phases of the study were quite effective to increase the ability of students to understand the concepts of science. Thus it can be stated that students who studied with conventional strategy of obtaining the mean score higher understanding of science concepts and differ significantly from the mean score of understanding of science concepts students learn PBMP strategy, PBMP.TPS, and PBMP.NHT caused by factors study habits and syntax conventional learning is deliberately designed so that students can master the subject matter. According Sutomo (2005), learning strategies PBMP is a learning process that seeks the empowerment of thinking of students through questions. These questions are arranged in such a manner, so as to form a pattern that sequentially includes the introduction, provide, perform, discuss, think, ponder, and then topped with a referral evaluation. Correspondingly Langrehr (2007) stated that the skills of thinking consists of a series of short questions that are stored in the brain and serves to manage the information coming into the brain. This means that pertnyaan-teacher questions in writing and verbally in worksheets for learning will be recorded in the memory of the student as a series of questions that make up the thinking skills of students.

The results showed that students 'academic abilities very significant influence on students' understanding of science concepts. There is a different understanding of the concept of science among students of high academic ability is low and as a result of the application of learning strategies PBMP, PBM.PTPS, PBMP.NHT, and Conventional. Students with high academic abilities gain understanding of concepts mean score higher than the mean score of students' understanding of science concepts low academic ability.

The results are consistent with results of previous studies which suggest that the ability of academic significant effect on the cognitive learning (understanding of the concept). The results are consistent also with Usman statement (2000) that the cognitive learning is closely linked to academic skills, students of high academic ability showed high learning activities that lead to higher cognitive learning outcomes than students low academic ability. Winkel (in Handoko, 2007), a student's academic ability is important to note in learning. High academic ability students more easily follow the learning activities. They are quicker to understand the subject matter compared with low academic ability students.

ANCOVA analysis of the results is known that the interaction of learning strategy and academic ability of students did not significantly affect students' understanding of science concepts. No significant difference in understanding the concept of science as a result of the interaction of learning strategy and academic ability of students. Although these results do not show significant differences from the mean score was corrected SCIENCE conceptual understanding can be obtained information that score mean any combination of learning strategy and academic ability is different for each combination. In a combination of a conventional-high academic strategy does not differ significantly from the combination of the conventional strategy-academic interactions is low, and PBMP high-academic; but the combination was significantly different third with a combination of high academic PBMP.NHT strategy, PBMPTPS high-academic,

Of these combinations can be seen that the combination of the interaction of the conventional strategy of high-achieving academic understanding of concepts mean score higher than other combinations. While the combination of strategic interaction PBMPNHT-low academic achieving a mean score Lowest understanding science concepts. From the mean score of understanding the

concept of correction can be known that the views from each combination there that shows the difference in mean score significantly understanding of the concept.

Referring to the results of research that has been described previously separate learning strategies and academic ability of students showed a significant difference to the understanding of science concepts. But in their interaction not significant effect on students' understanding of science concepts. Of the percentage increase in understanding of the concept of SCIENCE number of 28.94%. In a combination of strategies PBMP low-Academic increased understanding of science concepts number of 35.51%; on a combination of academic PBMP high-rise 55.17%; the combination of low academic PBMP.TPS increased 29%; the low academic PBMP.NHT rose 17.09%; the combination of high academic PBMP.NHT rose 29.43%; on a combination of conventional low academic strategy has increased 48.31%;

Noting the percentage increase in understanding science concepts on any combination of the interaction can be seen that the combination of high-Academic PBMP strategy is a combination of strategy and academic ability highest percentage increase understanding of science concepts. While PBMP-low academic interaction is a combination of the interaction of the lowest percentage increase understanding of science concepts. From the description it can be concluded that the interaction of learning strategy and academic ability no significant effect on students 'understanding of science concepts, however, when viewed in combinations of strategies with specific academic ability of these interactions affect the students' understanding of science concepts.

The implications of these findings related to the empowerment of thinking skills and understanding of science concepts elementary students in Mataram, in the implementation of learning strategies PBMP, PBMPTPS, and PBMPNHT necessary adjustments do not change the learning activities with learning the syntax of each of these learning strategies. Adjustments include: 1) in science teaching elementary strategy PBMP alone or combined with cooperative strategies teachers need to write on the chalkboard each of the results of discussions, demonstrations, experiments or observations of students correctly according to the concept of SCIENCE and relevant indicators of achievement student learning. It is important for elementary age students who still need guidance and correction of teachers in understanding the concept of science correctly; 2) allocation of SCIENCE limited instructional time, for demonstration or experimental activities that are in need of equipment and materials science learning activities should be implemented using time outside of school hours. This is done for demonstration activities and eksperiemen remain under supervision of teachers with sufficient time; 3) The teacher needs to practice questioning techniques to direct or guide students during the learning activities for the implementation of the instructional strategies teachers are not allowed to explain the subject matter. It is important for the development of thinking skills of students in order to achieve the main goal of applying these strategies is to empower students' thinking through the questions.

In the implementation of learning is becoming important for teachers to pay attention to the level of a student's academic ability in carrying out the study. Students of lower academic ability required special attention from the teacher in the form of tutoring in the classroom, both individually and in groups. Students of lower academic ability need to be motivated and generated interest in learning through a personalized approach. Mean while students of high academic ability are given specific tasks such as helping their peers to have low ability in accomplishing the

tasks of learning. For that in group discussions in the classroom as well as teachers divide into groups based on a student's academic ability, so that in a discussion group is heterogeneous in terms of a student's academic ability.

CONCLUSION

Learning devices that have been developed are devices PBMP, PBMP.TPS, and PBMP.NHT consisting of syllabus, lesson plan of PBMP, PBMP.TPS, PBMP.NHT and SAS PBMP can enhance understanding of concepts, of elementary school students in the city of Mataram. Application of learning devices developed in this study cannot be implemented consistently in elementary school science teaching in Mataram, because it is constrained by the ability of teachers' classroom management, saturation and study habits of students.

There is a difference in understanding the concept of science between students who are learning with PBMP learning strategies, PBMP.TPS, PBMP.NHT, and Conventional learning. Students studying with Conventional learning strategies show that the science concept comprehension score is higher than that of students learning with PBMP learning strategies, PBMP.TPS, and PBMP.NHT strategies. Because the syntax of conventional learning is oriented to the mastery of concepts. While the syntax of PBMP, PBMP.TPS, and PBMP.NHT strategy oriented to empowering thinking skills. The interaction of PBMP, PBMP-TPS, PBMP-NHT, and Conventional learning strategies with students' academic ability has no significant effect on understanding the concept of science.

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