THE EFFECT OF IMPLEMENTING DRILL METHOD TOWARDS LEARNING RESULT AND MOTIVATION BASED ON INITIAL MATHEMATICS ABILITY

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Abstract

The study discusses about the implementation of drill method on mathematics learning. The purposes of this study are: (i) to know the effect of implementing drill method towards learning result based on initial mathematics ability in XI IPA class of state senior high school in Palopo, (ii) to determine the difference of learning result between those who implement drill method and those who do not, (iii) to determine the effect of implementing drill method towards the students’ learning motivation in math class of XI IPA at State Senior High School in Palopo, (iv) to determine differences in learning motivation XI IPA class at State Senior High School in Palopo between class that apply drill method and which do not. This research is helpful to broaden and improve the quality of education in school. This is an experimental research, which consists of two classes i.e. one experimental class and one control class. The subject of this study is students of XI IPA class in Palopo and XI IPA class in SMAN 4 Palopo. The research instruments are the initial capability test, pre-test, post-test, lift, and observation. The result shows that (i) the learning by using drill method have effect towards student learning outcomes, (ii) there is a difference in learning outcomes of students in XI IPA class at SMAN in Palopo which apply drill method and which do not, (iii) there is a significant effect in implementing method towards the students’ motivation in learning math of class XI IPA at SMAN in Palopo, (iv) there is a difference in motivation to learn between XI IPA at SMAN in Palopo that apply drill method and which do not.

Keywords: Mathematics, drill method, initial capability, learning result, motivation

Background

The progress of a nation is determined by its human resources. If the human have quality in science and technology then the nation will move forward and continue to grow. Thus, there should be efforts to improve capabilities in the field of science and technology in order to raise dignity. The effort to improve science and technology plays a fundamental role of educational institutions as a place that creates human resources. The quality of human resources depends on the quality of education. Therefore, renewal and improvement of the quality of educational institutions should continue to be done.

The form of a practical exercise in mathematics, it can be in either objective or descriptive questions that are in the form of understanding, implementation, or even analysis so that students are highly demanded to have various abilities to solve them. Ability to solve math problems is derived from the number of exercises performed by the students. If students do exercises gradually and continuously, it will add reference about the formulas and techniques to solve problems. Mathematics learning process that requires the creativity of students is the core of implementing drill method.
Mathematical ability of students affected by the ability of early math students. The differences in students' initial ability are influenced by various factors. One of them is the students' motivation. Students in supporting the learning process should have a high motivation to learn. Not all students have high learning motivation. Motivation is when someone is willing to do something, but if he does not like, he will seek to eliminate or circumvent the feeling about disliking it. Motivation will encourage individuals to achieve the best levels from what he struggles, so this will drive success in the study, which will then be able to improve learning outcomes.

Based on the initial survey that is done, the data is acquired and showed that the average score of math exams in even semester of class XI SMA Negeri 2 Palopo and SMAN 4 Palopo academic year 2015/2016 is still low. If compared with the minimum completeness criteria, (KKM) in the class only reaches 78, then the whole students in the class are still having trouble in learning. This is because students are less trained in facing various models of questions that tested the effect on student learning outcomes.

Based on the reality, in this study, the author will use drill method which multiply students in performing exercises continuously so that students can indirectly understand the concepts, principles and facts as well as the procedures that exist in mathematics. Therefore, the authors are interested to carry out an experimental study entitled "The Effect of Implementing Drill Method towards Learning Result and Motivation Based on Initial Mathematics Ability of Students in XI Science Class of Senior High School in Palopo."

Review of the Literature

a. The Definition of Learning

Learning is essentially a change in attitude and behaviour of an individual in either quantitative or qualitative to a higher level than before. Thus, we can see that the learning has always embodied the notion of "change" that leads to progress. The characteristics of the activities of the so-called "learning" that is:

1) Learning is an activity that produces a change in individuals who learn, either actual or potential,
2) The change was basically in the form of acquiring new capabilities, which is applicable in a relatively long time,
3) The change comes because of the effort (Noehi Nasution, 1993: 3)

b. The Definition of Teaching

Teaching is basically an attempt to create condition or environmental system that support and allow for ongoing learning process. If learning is said to belong to the students, then teaching is teachers' activities.

Then, a broader sense, teaching is defined as an activity to organize or manage the environment as well as possible and connects to children, so that a process of learning happens. In other words, teaching as an effort to create conducive condition to ongoing learning activities for students. The condition is created in order to optimally help the development of children both physically and spiritually, physically and mentally.

c. The Definition of Mathematics

Mathematics is a universal science that underlies the development of modern technology, has an important role in various disciplines and the development of human
thinking. Mathematics should be given to all learners from primary schools to equip learners with the ability to think logically, analytically, systematically, critically, and creatively and the ability to cooperate.

d. Drill Method
Drill is an exercise with repeated or continuous practice to gain practical skills and dexterity about learned knowledge (Sriyono, 1991: 112). Moreover, it is expected that the knowledge or skills they have learned to become permanent, stable, and can be used at any time by the person concerned. This method is appropriate to obtain:
1) Memory Skills: saying words, asking and giving questions, proper grammar usage in foreign language teaching.
2) Mental skills: multiplication, add, subtract, divide, and others.

e. Learning Outcome
The learning result/outcome is an activity that achieves maximum capacity as a result of treatment in its activities. Learning outcome will never be produced as long as someone does not do the activities. In fact, to get the result is not as easy to learn what he envisioned, but struggling with the challenges that must be overcome to achieve it. Therefore, learning itself is complex with various activities such as listening, remembering, reading, demonstrating, doing something as well as utilizing the experience, it can be said that the process that results in a change in individuals who learn, and it is manifested by behaviour is learning outcome.

f. Motivation
Motivation comes from the English word meaning an encouragement, and motivation. The word "motive", can be interpreted as an effort to encourage someone to do something. Motive can also be said as the driving force from the inside and on the subject to perform certain activities in order to achieve a goal. Even motive can be interpreted as an internal condition (preparedness). By starting from the word "motive", motivation can be defined as the driving force that has become active. Motive becomes active at certain moments, especially when the need to achieve the goal is perceived / urgent (Sadirman, 2006: 73).

g. Initial Capability
Students' initial ability is an ability that has been owned by the student before joining the study. Students who have a similar ability to start could be brilliant or slumped on one subject, depending on the love or hatred of the lesson. As a teacher, it is important to know the initial ability of students to determine the strategy and teaching styles accordingly. In addition it can also be used to determine the extent students’ knowledge so that teachers know the extent to which the student's readiness to accept the subject matter to be delivered.

Methods
a. Kind of Research
This research is an experimental research will compare the results of treatment in two methods of learning i.e. drill method and conventional method. The design of this study is two classes chosen as samples, respectively obtained by applying drill and conventional method.

b. Place and Time
This research is conducted in Senior High School in Palopo. The population of this research is SMA Negeri 2 Palopo and SMAN 4 Palopo. The research is conducted in the second semester of the school year 2016/2017. The units of experimental research are taking from the existing population by random sampling, which took two classes at random from several classes that parallels the assumed homogeneous in terms of learning outcomes math before the study was conducted to serve as an experimental unit.
c. **Operational Definition of Variables**

In this study, there are two variables i.e. independent variable and dependent variable. Learning method is as independent variable, while dependent variable is the result of students’ mathematics learning.

**Independent variable:**
- Drill method is an exercise with repeated or continuous practice to gain practical skills and dexterity about learned knowledge.
- **Dependent Variable:**
  1) Result of mathematics learning is a learning outcome achieved by students after studying mathematics in a certain period of time which measured by using specific evaluation tools in this regard achievement test.
  2) Motivation is the drive of individuals or groups that can activate the behaviour or actions to achieve certain goals.

**Accompanied Variable:** Students’ initial ability is an ability that has been owned by the student before the following study

**d. Research Design**

The design of this research can be explained as follows. One experimental class in which selected randomly then administered tests of the students’ early math abilities. Next, the students are given pre-test to obtain information about students’ ability in relation to the material that is going to be taught, and then control class receive conventional learning treatment and experimental class obtain drill method as its treatment.

**e. Research Instrument**

The instrument used in this study is in the form of tests to obtain data on the results of studying mathematics, observation sheet to obtain data on student activities, and a questionnaire to collect data about students’ motivation.

**f. Procedure Research**

Preparation phase begin with examination of high school curriculum in class XI SMA Negeri 2 Palopo and SMAN 4 Palopo. Then learning device and learning equipment were prepared, following with preparing data collection instrument which firstly validated by validation officer.

Implementation Phase insist of choosing two classes that will be the subject of the research randomly, and doing learning activity, as follows: Experimental class is given treatment by implementing drill method learning, then Control class is only treated with conventional method. Data collected as result of learning.

**g. Statistical Hypotheses**

Based on the hypothesis that has been previously arranged, so that it can be arranged statistical hypotheses as follows:

**Hypothesis 1:** The effect of implementing drill method towards learning result based on initial mathematics ability of XI IPA class at SMA Negeri in Palopo city?

\[ H_0: \mu_{g1} = 0 \ \text{Against} \ H_1: \mu_{g1} > 0 \]

\( \mu_{g1} \) = Average Score parameter normalized gain learning by using drill method

**Hypothesis 2:** The difference of XI grade students’ learning result at SMA Negeri in Palopo city which implements drill method and the one which do not

\[ H_0: \mu_{g1} = \mu_{g2} \ \text{Against} \ H_1: \mu_{g1} \neq \mu_{g2} \]

\( \mu_{g1} \) = Average score parameter normalized gain learning by using drill method

\( \mu_{g2} \) = Average score parameter normalized gain learning by using conventional method
Hypothesis 3: The effect of implementing drill method towards XI grade students’ learning motivation at SMA Negeri in Palopo City

\[ H_0: \gamma_1 < 1.5 \quad \text{and} \quad H_1: \gamma_1 \geq 1.5 \]

\[ \gamma_1 = \text{Average score of students’ learning motivation that implement drill method in XI IPA class at SMA Negeri in Palopo City} \]

Hypothesis 4: The differences of learning motivation of XI IPA Students at SMA Negeri in Palopo City which implements drill method and which do not.

\[ H_0: \gamma_1 = \gamma_2 \quad \text{and} \quad H_1: \gamma_1 \neq \gamma_2 \]

\[ \gamma_1 = \text{Average score of XI IPA students’ learning motivation at SMA Negeri which implements drill method in Palopo city} \]

\[ \gamma_2 = \text{Average score of XI IPA students’ learning motivation at SMA Negeri which implements conventional method in Palopo city} \]

Discussion

In conducting the study, learning method is needed to achieve the goals and objectives of learning. Drill method is a method of learning that is considered effective for involving students’ activity in solving exercises to achieve the learning objectives.

In this study, two different behaviours are used i.e. learning which implements drill method on XI IPA 2 class and conventional learning in class XI IPA 3 which conducted in SMA Negeri 2 Palopo and SMAN 4 Palopo. In addition, it is to know whether the treatment is effective, so that comparative test (difference test) t-test comparisons are used.

Before the treatment is given, both classes are given initial capability test which is a mathematical skill that actually possessed by the students. This initial capability aims to find students who have high or low initial ability.

In SMA Negeri 2 Palopo, after giving initial capability test for the experimental class amounted to 73.2 and the control class is 64.05. This indicates that these two classes have different starting abilities. After pre-test was given to the experimental class is at 29.38 and the control class is 31.19. After being given a pre-test, each class was given treatment that the experimental class given drill method treatment while the control class have conventional learning.

After being given the treatment, then students in learning by drill methods and conventional method are given a post-test to determine the final ability of the students after being given the treatment. After the second class are given, a post-test result is 78.43, while control class is 78.22. Based on the research that has been done shows that learning by drill methods improve student learning outcomes which can be seen from the average score of the learning method and average grade compared with conventional. The criteria of success in learning outcomes of classical learning in the classroom is 85% based on the reference minimum completeness criteria (KKM) which set by the school is 78.

The results of students’ learning motivation questionnaire results showed that the average student motivation increases with the average of 3.10. Whereas in conventional learning averaging students’ motivation questionnaire results with the average of 3.00. This shows that the students ‘motivation to learning by using drill method is increased compared to conventional learning.

On average both post-test and gain class by learning drill method further improved compared to conventional learning. This shows that learning outcome, as well as students' motivation increased compared to conventional learning. Moreover, in testing hypotheses about the results increase classroom in learning by using drill method and conventional learning methods show a difference. This difference is due to many factors.
including activity of students in learning, lack of understanding the material, and the students' lack of motivation.

At SMAN 4 Palopo, after receiving initial capability test, the experimental class is at 67.65 and 41.05 for the control class. This indicates that these two classes have different starting abilities. After pre-test was given to the experimental class, it is at 30.68 and the control class is 28.05. After being given a pre-test, each class was given treatment that the experimental class given drill method treatment while the control class given conventional method of learning.

After being given the treatment, then the student in learning by using drill method and class with direct instruction are given post-test to determine the final ability of the students after being given the treatment. After the second class are given a post-test is 79.25, while control class is 78. Based on the research that has been done shows that learning by drill method improve student learning outcomes which can be seen from the average score of learning the drill method and the average grade by conventional learning. The completeness results of classical learning in the classroom is 85% based on the reference minimum completeness criteria (KKM) which is set by the school is 78.

The results of students' learning motivation questionnaire results showed that the average student motivation increases with the average of 3.12. Whereas in conventional learning averaging students' motivation questionnaire results with the average of 3.06. This shows that the students' motivation in learning drill method increased in compared with conventional learning.

On average both post-test and gain class by learning by learning drill further improved with conventional learning. This shows that learning outcomes, as well as students' motivation increased as compared to conventional learning. Moreover, in testing hypotheses about the resulting increase classroom learning with drill method and conventional learning method are different. This difference is due to many factors including activity of students in learning, lack of understanding the material, and the students' lack of motivation.

Moreover, in testing hypotheses about the increase in classroom learning result with learning by drill method and conventional learning method show a difference. This difference is due to many factors including activity of students in learning, lack of understanding the material, and the students' lack of motivation.

Conclusion
The conclusions that can be drawn in this study are as follows.

a. The implementation of drill method in many parts of material in XI class at SMA Negeri 2 Palopo is at 3.68 with good category and SMAN 4 Palopo of 3.9 with very good category. The research at 2 schools shows that the implementation of learning by drill method is categorized as good category.

b. The implementation of drill method in XI class at SMA Negeri 2 Palopo is effective in terms of the following aspects: (a) the learning outcomes of students with an average score of pre test is 29.08 smaller than the average score of post-test at 78.22, the average score in normalized gain was 0.6 at medium category, (b) learning activities of students on average 3.37, including in medium category. The implementation of drill method in XI class IPA at SMAN 4 Palopo is effective in terms of aspects: (a) the learning outcomes of students with an average score of pre-test is 30.68 smaller than the average score of post-test at 79.25, the average score was 0.6 in the normalized gain at medium category, (b) learning activities of students on average 3.7 is included in high category.
c. Learning motivation of students in SMA Negeri 2 Palopo increase on class with drill method i.e. 3.10. While learning motivation of students in SMA Negeri 4 Palopo increase on class with drill method i.e. 3.12.

Reference


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