EXPERIMENTAL STUDY ON THE INDIVIDUAL AND GROUP ASSIGNMENTS IN SENIOR HIGH SCHOOL (SMA) 3 PADANG SIDIMPUAN

Agus Makmur

Department of Mathematics, Universitas Graha Nusantara, P. Sidempuan, INDONESIA.

agus_mp_ugn@yahoo.com

ABSTRACT

Mathematics is one of the difficult subjects for senior high school in Indonesia. With an experimental design; the two different research treatments, was carried out in Senior High School (SMA) 3 Padang Sidempuan, South Tapanuli Regency of Indonesia. It compared the students' learning result in learning the functional composition between who obtained group and individual assignments in the second grade of Senior High School (SMA) 3 Padang Sidempuan academic years 2016-2017. The test scores that have obtained were analyzed the t-test statistic formula. With an ideal score of 15; the average class score of students in second grade of Senior High School, The experimental group got the average score = 10,14 with variance = 2.201, standard deviation = 1.483. In contrast, the control one was = 8.64 with variance = 3.201 and standard deviation = 1.789. It concludes that the group work make students average in Mathematics is better that that of individual one.

Keywords: Group, individual, assignment, experimental, Mathematics

INTRODUCTION

Background of Study

Mathematics as one of the important tools and knowledge for Senior High School students in Indonesia needs many of experimental and ethnographic studies. Not a few students describe that the Math is a difficult lesson that makes them boring and scary. For example, material presentation of functional composition at Senior High School is seen as one of the Math material that is difficult to be absorbed by the students; the material of functional composition is dominated by algebraic manipulation. Such assumption makes students increasingly dislike of Math lessons. This may affect the learning of Mathematics in primary and secondary schools, as many of the students are already preoccupied with learning difficult lessons before experiencing actual learning.

One of the goals of Mathematics at the level of primary and secondary education is to prepare students to be able to use Mathematics and mathematical mindset in everyday life. (Depdiknas, 2006: 1). This suggestion implies that Mathematics learning is not for Mathematics, but to be utilized in everyday life. The purpose of learning Mathematics with other details is reasoning, connection, communication and presentation. Reasoning as the purpose of learning Mathematics means that students are expected to be able to use Mathematics as a means of reasoning (logical thinking, critical, systematic, and objective). Reasoning includes basic thinking, critical thinking, and creative thinking. Mastery of critical thinking skills is not enough to serve as an educational goal alone, but also as a fundamental process that allows students to overcome future uncertainties.

The difficulty of presenting the functional composition was also felt by the Mathematics teacher in second grade of Senior High School (SMA) 3 Padang Sidempuan. The teacher's disappointment arises when the students are only able to work on questions that are in accordance with the teacher's example, while the ones that require reasoning and creativity cannot be solved. Mathematics teachers admit that the presentation of functional composition is still using lecture, expository and drill method, whose learning technically in the class follows the general practice of mathematical presentation, that is explanation, giving example, individual students doing the exercises according to the example, and sometimes there are one or two students who show the work on the board. Mathematics teacher in the second grade of Senior High School (SMA) 3 Padang Sidempuan also said that he has not got a new idea that allows the achievement of learning goals more successful.

However, the researcher is still unsure of the success of using inquiry method, student activity sheet, and assignment method in presenting the function composition to obtain optimal student learning outcomes. It is precisely that it is felt necessary to conduct research to compare the individual and group assignments in learning of Mathematics; functional composition in the second grade of Senior High School (SMA) 3 Padang Sidempuan.

Formulation of the Problem

The problem of this study formulated: Does the group assignment make the students achievement better than of individual in Mathematics of Senior High School (SMA) 3 Padang Sidempuan Academic Year 2016-2017?

THEORETICAL FRAMEWORK

Mathematics learning should provide opportunities for students to try and find experience in learning Mathematics (Sardiyanti, 2010). The tendency that occurs in the learning of Mathematics in schools is that students are treated as objects. The teacher is seen as the most knowledgeable person and can act as a judge who decides whether the student's work is right or wrong. Learning process generally begins with teacher explanation. When the teacher explain the material, the student must be silent, listen and should not respond or discuss what he or she is listening to. According to Hudojo (1988: 122) that: "Learning Mathematics will be successful if the learning process is good, which involves intellectual children / learners optimally". Teacher explanations are also often focused on how a mathematical formula is obtained, which in the next stage is given a sample of usage and then given the opportunity to students to work on a problem like the example the teacher has given. Such education causes our educational practices to isolate ourselves from real life outside the school, less relevant between what is taught and needs in work, too concentrated on intellectual development that does not work with individual development as a whole and personality.

One of the terms stuck out of Government Regulation No. 19 of 2005 is the process standard. Process standards are the national standard of education related to the implementation of learning in educational units to achieve graduate competence. Process standards include the planning of the learning process, the implementation of the learning process, the assessment of learning outcomes, and the monitoring of the learning process for the implementation of an effective and efficient learning process. Implementation of the learning process is the core of learning and is the key to the achievement of learning objectives. Minister of National Education Decree No. 41 of 2007 stated that in the learning process required teachers who provide exemplary, build willingness, and develop the potential and creativity of learners. The implication of this principle is the paradigm shift in the educational process, namely from the paradigm of teaching to the learning paradigm. Implementation of the learning process is generally called learning activities include opening, main and closing. Opening is

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an early activity in a learning meeting aimed at generating motivation and focusing the attention of learners to actively participate in the learning process. The main activity is a learning process to achieve the learning objectives. Learning activities are interactive, inspirational, fun, challenging, motivate learners to participate actively, and provide sufficient space for initiative, creativity, and independence according to the talents, interests, and physical and psychological development of learners. This activity is done systematically through the process of exploration, elaboration, and confirmation. Closing is an activity undertaken to end learning activities that can be done in the form of summaries or conclusions, assessment and reflection, feedback, and follow-up.

In the opening stage, teachers need to improve students' readiness in learning, either by providing motivation, or revision of the possible misconceptions of materials they have learned as apperception for new concepts or principles to be studied. With the paradigm shift in the process of education, the students in learning should no longer have to sit still and listen to it. Interactive and inspirational are some of the expected learning characteristics in Regulation Number 41 of 2007. Teachers should be encouraged if any students raised their hand to ask or respond to teacher's explanation. Teachers should be proud if there are students who ask that he (the student) be given the opportunity to continue a work on the board.

Learning process is the interaction or reciprocal relationship between students to teachers and among fellow students in the learning process. The understanding of interaction contains elements of mutual in giving and receiving. In the interaction of teaching and learning are characterized by a number of elements: (a) Objectives to be achieved, (b) students, teachers and other learning resources, (c) learning materials; and (d) methods used to create teaching and learning situations. The essence of learning is a process of changing attitudes, behaviors, and values after interaction with learning resources. Learning resources other than teachers can be books, the environment, information technology and communication or fellow learners (fellow students). Thus, the task of teachers in the process of learning in the classroom is to create situations that can stimulate students to learn. Learning does not have to be a process of transforming knowledge from teachers to students. In the process of teaching, teachers are in charge to create a fun and conducive learning atmosphere. With certain techniques the teacher must be able to condition the students in an active situation to construct their own knowledge, providing sufficient space for initiative, creativity, and independence according to the talents, interests, physical and psychological development of learners.

There are three points of view that can be used to determine the success of students in learning Mathematics that is reasoning, process and outcome. Given these three points of view are related, the Mathematics lessons must be done carefully by the teacher in order to obtain optimal results (Gusmita, 2014). This is consistent with a thoroughly principled assessment, an assessment that includes learning processes and outcomes, which gradually reflect behavioral changes. Teachers also need to give the opportunity to some students to model, such as to show in front of the class what students have mastered after going through the learning process to teachers and classmates. If the concept of the material studied is considered adequate, then in the process of continuing the students should be given the opportunity to apply the things previously learned in the form of exercise questions as well as the use and development of further reasoning. According to As'ari (2000):

> *The expected behaviors of Mathematics learning should be as follows: (a) the giving of information, instructions and questions by teachers should be only*

about 10 to 30% and the rest coming from students, (b) students seek information, search, select and use information resources, (C) students take more initiative, (d) students ask questions, (e) students participate in the process of planning, implementation and evaluation of learning, and (f) there is self-assessment and peer assessment. The application of the things learned in the second stage, the training phase as well as the use and development of further reasoning. Thus qualified Mathematics learning will occur if the learning process experienced by the students and the teaching process by the teacher is effective.

In the assessment, the effectiveness of teaching and learning process should be reviewed the effectiveness of influential components in learning. For example, students are motivated to learn, the material is interesting, the purpose is clear, and the results can be felt the benefit. To obtain optimal Mathematics learning outcomes needs to be supported by a general framework of learning activities that support the ongoing learning process, known as the Mathematics teaching structure.

Assignment Method

The method of assigning tasks can be interpreted as a teaching-learning interaction format characterized by the presence of one or more tasks assigned by the teacher, whereby the completion of these tasks can be done individually or in groups. The method of giving tasks is a presentation of learning materials where teachers provide certain tasks so that students do learning activities and provide reports as a result of the tasks it does. This method refers to the application of learning by doing.

Assignment of duties as a method of teaching is a gift of work by teachers to the students to achieve certain teaching objectives. With the assignment of the students learn, do the task. In carrying out the learning activities students are expected to obtain a result in the form of certain behavior changes in accordance with the objectives that have been established. The last stage of this assignment is the recitation which means to report or restate the task that has been done or studied. Homework has a more specific understanding is the tasks assigned by teachers, done students at home. While the recitation, the task given by the teacher is not just implemented at home but can be done in other places that have to do with the task / lesson given. So the recitation is wider than homework, but both have similarities, that is having the element of task, done by the students and reported the results have a didactic pedagogical element.

Group Assignment Method

The term of group work or group assignment implies that students in a class are divided into groups, both small groups and large groups. Grouping is usually based on principles to achieve common goals. The method of group assignment referred to in this study is one way of learning where in the process of teaching and learning in a class is divided into several small groups of each group consisting of 4-5 people. The use of group assignment methods has the goal of enabling students to work with other students in an effort to achieve common goals and provide opportunities for students to develop a sense of respect for the opinions of others and the ability to interact in groups and between groups. The considerations developed in this learning method are:

1. Students as individuals have different abilities.
2. Students as social beings have a strong urge to display their power in front of others and have a need to communicate with others.

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This will always be compatible between one with another component. The intended components are teachers, students, methods, tools, means, objectives, and others. To achieve the instructional objectives, of each component, the components respond to each other and influence each other. So the task of the teacher is how to design each component in order to create a more optimal learning process.

RESEARCH METHOD

This study was conducted in an Experimental Design; with the treatment to change the characteristics of students. The initial survey showed that Senior High School (SMA) 3 Padang Sidempuan has seven classes of students in the second grade. Four of the seven classes are majoring in Sciences. The three other are Social Humanities field. It took 167 students in Sciences field as sample. Treatments are learning using Group assignment (for Experimental Class) and individual assignment (for Control Class). Both groups were administered in pre test and post test to obtain final test scores.

RESEARCH INSTRUMENTS

The research instrument is a tool used by researchers to collect research data. Considering that the data needed in this research is the result of the study of the students of Sciences class in the second grade of Senior High School (SMA) 3 Padang Sidempuan in the material subject of functional composition, pre and post tests were administered. A review of the subject matter of the functional composition and the existence of several variations of the questions that students must master after study, so for this final test requires 15 items. The reason for this is to give consideration for the author to establish a multiple choice test with five answer options. The test work time is about 35 minutes. The score given for the correct answer is 1 whereas the wrong answer is given a score of 0.

Tabel 1. The Guidelines of Final Test

No.	*Indicator*	*Question Number*	*Measured Aspects*
1	Determining the operation result of two functions and its value	1, 2, 12	C2, C3, C2
2	Determining the composition function of some functions	3, 4	C3, C3
3	Determining the compositional component-forming component when the composition and other components functions are known.	5, 6, 7, 8, 9	C3, C3, C3, C3, C3
4	Explaining the requirements for a function to have an inverse.	14	C2
5	Determining the inverse function of a function.	10, 11, 13, 15	C3, C3, C3, C3

RESEARCH RESULT

Pretest was done before the presentation of the subject matter gives the same pair of scores from the two classes of 28 couples. The learning of compositional and inverse material was carried out in 17 lesson hours with 9 hours of lesson for function composition and 8 hours lesson for inverse function. It turns out that all the students who entered the sample members of these two classes are always present and follow the implementation of the final test of learning. Thus the size of each sample is 28 students.

Scoring of student answer sheets was done after the implementation of the final test of learning to produce two groups of data, namely (1) the results of student learning class of science 3 in the second grade of Senior High School (SMA) 3 Padang Sidempuan in the material subject of functional composition in learning using group assignment, abbreviated student learning outcomes with Group assignment, hereinafter expressed as and (2) result of study of student of class of science 2 in the second grade of Senior High School (SMA) 3 Padang Sidempuan in material subject of functional composition which in its learning using individual assignment, abbreviated student learning result with individual assignment, hereinafter expressed as. It turns out from this set of scores, the highest score obtained by students in the presentation of the material subject of functional composition in the learning using group assignment was 13 and the lowest score was 7, whereas in the presentation of the material subject of functional composition in the learning using individual assignment was 12 and the lowest score was 5. The normality test by Lilliefors technique showed that both groups of data come from normally distributed populations, it means that the samples of this study were representative and the conclusions can be used for the population. Using the homogeneity test of variance, F test also found that the variance of both samples is equivalent or homogeneous.

Considering that the samples of this study come from normally distributed populations and the variance was homogeneous, there was no reason for the researcher not to use t-test as a tool for hypothesis testing and to apply research conclusions to the population. After using the t-test, it was found that the result of the students' learning that gets the group assignment is better than those who get individual assignment in learning the functional composition in the second grade of Senior High School SMA Negeri 3 Padang Sidempuan.

DISCUSSION

Researcher does not deny that the experience of teaching in high school is still very little. However, the experience of presenting the material of the composition of functions in the course of conducting this study is of great value to the researcher. There are some impressions that are hard to forget from the experience of presenting this, which hopefully becomes thought and guidance in implementing future math learning. Some interesting things related to the implementation of learning using the method of group assignment and individual assignment deserve to be presented in this discussion. First, students 'interests and activities in group work are higher than the students' interests and activities in performing individual tasks. The desire to express opinions in carrying out many group tasks arose from the students. Unlike the class whose lessons use the individual assignment method, which some students in the class tend to see the work of a friend of the shirt or friends behind it before starting to do their own work. Big guesses of this are due to a sense of fear will make a mistake if you do it yourself without seeing first how friends do it. It is also suspected that this is due to a lack of self-confidence so that even if students have their own opinions about the task, they are still more confident with the workmanship of their friends. But with group assignments, students seem to be more focused on working on problems with group mates. It cannot be denied, there are still students who are always passive, and submit everything to a group of friends, while students like this resigned no matter how the outcome. Second, in terms of doing the exercises on the board, students usually seem to be penalized. However, when working on a question on the board it is assigned to the group, meaning that students who work on questions on the board still have a companion, so the work seems to be more fluent. Psychologically, it may be a nervous feeling and fear that students will make a mistake by themselves solved by a friend working on the board. Third, from certain students

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can be expected explanation about the work on the board. Couples will collaboratively provide an explanation of the workmanship to a friend who asked.

Based on data analysis of final test results that have been done, from this study was obtained some findings, among others:

1. With an ideal score of 15, the average class XI student's score (SMA) 3 Padang Sidempuan in the material subject of functional composition in the learning using group assignment was = 10,14 with variance = 2.201 and standard deviation = 1.483.
2. With an ideal score of 15, the average class score of students in second grade of Senior High School of SMA Negeri 3 Padang Sidempuan in the material subject of functional composition in the learning using individual assignment was = 8.64 with variance = 3.201 and standard deviation = 1.789.
3. If the average student score was converted to a scale of 1-10, which means the score of student acquisition compared with the ideal score, then obtained the results of student learning in the second grade of Senior High School 3 Padang Sidempuan in the material subject of functional composition in the learning using group assignment was 6.76. While the results of student learning in the subject matter of the composition of the function in the learning using individual assignment was 5.76.
4. Between the results of student learning in the second grade of Senior High School (SMA) 3 Padang Sidempuan in the material subject of functional composition in the learning using group assignment by using individual assignment has a difference of 1.00. Although this difference is small, but significant according to statistical calculations.

Considering that the difference in learning outcomes was significant according to hypothesis testing, the issue of size or magnitude was no longer a measure. What is clear, the results of student learning in the second grade of Senior High School 3 Padang Sidempuan in the material subject of functional composition in the learning using group assignment was significantly higher than the results of student learning in the second grade of Senior High School 3 Padang Sidempuan in the material subject of functional composition in the learning using individual assignment.

CONCLUSION

Based on data analysis of the second grade achievement of Sciences Class of Senior High School (SMA) 3 Padang Sidempuan in the material subject of functional composition, it was obtained the Science Class III of Senior High School (SMA) 3 Padang Sidempuan learning Math with group assignment was higher than that of individual one. The results of students learning in the second grade of Science Class II of Senior High School (SMA) 3 Padang Sidempuan with individual assignment was lower. Therefore, it concluded that the students' learning outcomes in learning the functional composition that got through a group assignment was better than those who taught in the individual assignment

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