THE EFFECTIVENESS OF CONTEXTUAL APPROACH IN TERMS OF CONCEPTUAL UNDERSTANDING AND LEARNING MOTIVATION OF JUNIOR HIGH SCHOOL STUDENTS

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Diajukan kepada Fakultas Matematika dan Ilmu Pengetahuan Alam
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Abstract

This study aimed to describe the effectiveness of contextual approach implementation using REACT strategy in terms of conceptual understanding and learning motivation of junior high school students in the learning of lines and angles. This research is a quasi experimental design with pretest-posttest control group design. The population includes all students of class VII in SMP Negeri 2 Depok. The selected sample is class VII A as an experimental class and class VII C as the control class. The instrument used in this study is test instrument used to measure understanding of mathematical concept which consists of pretest and posttest and nontest instruments in the form of questionnaire to measure students' motivation and learning observation sheets. Hypothesis testing method used was t test they are one sample t-test and independent sample t-test. The results showed that: 1) mathematics learning with contextual approach is effective in terms of conceptual understanding, 2) mathematics learning with contextual approach is effective in terms of student learning motivation, 3) mathematics learning with conventional approach effective in terms of conceptual understanding, 4) mathematics learning with conventional approaches effective in terms of student learning motivation, 5) contextual learning and conventional learning are effective in terms of conceptual understanding, and 6) contextual learning and conventional learning are effective in terms of learning motivation.

Keywords: contextual approach, conceptual understanding, learning motivation, conventional approach

INTRODUCTION

Education has a strategic role in the development of a nation. It makes the government made efforts to improve the quality of national education.One of them stated in the objectives of the KTSP that teachers are required to develop curriculum in the implementation of learning. One thing to do is to choose the appropriate learning approaches that consistent with curriculum and also the character of students in the school.

One learning approach that can apply in the KTSP is contextual approach. Contextual approach (Contextual Teaching and Learning/CTL) is the concept of learning that help teachers linking the learning materiak with the students' real-world situations and encourage students to make connections between the knowledge they have and the application of their knowledge in their lives as members of the family and society (Ali Mahmudi, 2010). Contextual approach can be applied in several subjects, including the learning of mathematics.

In line with the development of mathematics education in Indonesia, there has been some research on the effectiveness of contextual approach. One of these studies conducted by Dian Putri Safrine entitled Effectiveness of Contextual Learning Towards Conceptual Understanding Students in SMP N 1 Ngaglik, Sleman, Yogyakarta on the material Solid Geometry. Based on research, it is known

that a contextual approach is effective to improve students' mathematical concepts. Concept is one of the direct object in mathematics. A mathematical concept is an abstract idea that can be used to classify set of objects is an example or not an example. In addition, the concept is also one of the three types of knowledge determined by the National Mathematics Advisory Panel (Willigham, 2010: 16). The third type of knowledge that is factual, procedural and conceptual. Knowledge brings students into the concept of understanding or meaning something. While the procedural is steps to resolve a problem which arise frequently. A student who has been able to carry out a procedural problem solving does not always have an understanding about the concept of the problem. For example, many students are able to perform a division operation but does not understand why the division operation steps can be done. Teaching the mathematical concepts in junior high school students will help in understanding the concept of mathematics at the next level.

Based on observations in SMP N 2 Depok, these schools apply learning with conventional approaches in learning mathematics. At the time of learning, the teacher become learning resource that provides an explanation to the students regarding the material. At the time of doing exercises, students in these schools still have problems with the questions presented in real contexts. Submission of mathematical concepts through notes or lectures provided by the teacher to make students acquire passive concept. This makes students confused in its application to the problems based on real context.

In addition the mathematical concept which is the direct object of learning mathematics, there are indirect object of learning mathematics that can help develop students' character. One of the indirect object of mathematics is a positive attitude towards math. Students who have a positive attitude towards mathematics will feel happy when learning mathematics. In terms of affective and behavioral students in the classroom, researchers observed that there has been no positive attitudes in students towards learning mathematics. It is seen from the students' responses were less enthusiastic in following the mathematical leaning. It may result from the lack of student learning motivation in mathematics. Both the internal and external motivation derived from students learning environment. External motivation can be done by the teacher verbally or in the preparation of learning activities in the classroom.

A study conducted by Adedeji Tella (Tella, 2007: 150) about the effect of motivation on student achievement showed that the characteristics of a student such as motivation, self-esteem and learning approaches, thtat are three important aspects that can affect a student's academic achievement. The results show that there is a positive effect of motivation on student achievement. Adedeji Tella (2007: 155) suggests that teachers should pay attention to the aspect of learning motivation in preparing lessons.

Learning in the classroom is not only played by the students or by teachers alone. Participation of teachers and students is crucial for a success in a study. Noting the motivational aspects that form the basis of a student do an activity to learn, demanding the teacher's role to devise learning that can memtoivasi. As a research conducted by Fitriyani (2009), which examines The Effectiveness of Contextual Approach In Improving Students' Motivation. The results showed that the contextual approach effective to improve students' motivation.

Based on the description above, this study was conducted to describe the effectiveness of contextual approach and the conventional approach in terms of students 'understanding of mathematical concepts and students' motivation. In addition, this research also conducted to describe the effectiveness comparison between contextual and conventional approach to improve the understanding of mathematical concepts and students' learning motivation.

RESEARCH METHOD

Design Research

This research was a quasi-experimental research. The research design used was pretest and posttest control group design.

Time and Place

This research was conducted at SMP Negeri 2 Depok, Sleman, DIY in the second semester of academic year 2015/2016 held on March 18th 2016 until April 26th 2016.

Subject

The subject of this research was consist of 28 students of class VII A and 28 students of class VII C in SMP Negeri 2 Depok. Class VII A as an experimental class with contextual approach and class VII C as control class with conventional approach.

Variables

The variables consisted of independent and dependent variables. The independent variables was learning approach which varied as contextual approach using REACT strategy and conventioanl approach. The dependent variable was conceptual understanding and learning motivation of junior high schooll students in the learning of lines and angles.

Population and Sample

The population of this research was all the students of grade VII SMP Negeri 2 Depok that consisted four classes. The samples were class VII A and VII C. Class VII A was experiment class which given contexual approach, while the control class was class VII C which given conventional approach.

Instruments and Data Collecting Techniques

The instruments used in this research were learning instrument, i.e. lesson plan and student worksheet, pretest and posttest as test instrument to measure students' conceptual understanding, and nontest instrument, i.e. questionnaire to measure students' learning motivation and observation sheets. The observation sheets were used to observe and record the student's activity during the learning process.

Data collecting techniques implemented by providing a pretest before treatment and posttest after treatment to measure student understanding of mathematical concepts in both classes, experimental and control classes. The mathematical problem on pretest and posttest consisted of four problems about understanding concepts with a maximum score of 100. The data collecting techniques for students lerning motivation implemented by providing the learning motivation questionnaire before and after treatment in both classes. Learning motivation questionnaire consists of 30 items with a maximum score of 150. The instruments that have been made, validated by expert lecturers (expert judgment) to determine if the instrument is valid and can be used or not. The results of the validation instrument states that the instrument can be used with the revision.

Data Analysis Techniques

The data collected were analyzed by making the description of the data that consisted of the early stage description and the end of stage description. The early stages description consisted of normality and homogeneity test. Normality test was performed by using the Kolmogorov-Smirnov test with a significance level $\alpha=0.05$. The homogeneity test was performed by using the Levene test with a significance level $\alpha=0.05$. The end stage description was hypothesis test.

The first hypothesis test was done to know the effectiveness of learning in the experiment class in terms of conceptual understanding. The second hypothesis test was done to know the effectiveness of learning in the experiment class in terms of students learning motivation. The third hypothesis test was done to know the effectiveness of learning in the control class in terms of conceptual understanding. The fourth hypothesis test was done to know the effectiveness of learning in the control class in terms of students learning motivation. For the conceptual data the test used was one sample t-test by comparing the gain score mean of each class to the minimum standard value (gain score), i.e. 0,40. For the motivation data the test used was one sample t-test by comparing the mean of each class to the minimum standard value, i.e. 102.

The fifth hypothesis test was done to know the difference between gain score means of the two classes to know whether contextual is better to improve the conceptual understanding. The sixth hypothesis test was done to know the difference between means of the two classes to know whether contextual is better to improve the learning motivtion. The fifth and sixth hypothesis used independent sample t-test. All the tests were done using SPSS 23.

RESULT AND DISCUSSION

The learning processes of both classes were conducted by researcher herself according to the lesson plan for each class. The overall learning processes were in accordance with the lesson plans.

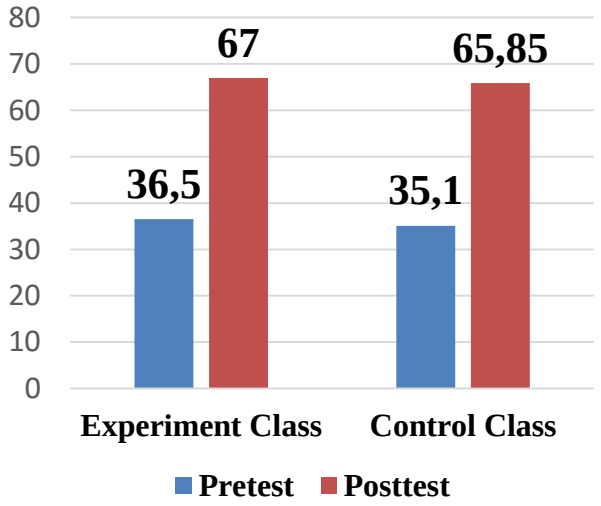
Description of Data

The data collected in this research consisted of pre-test, post-test, gain score, initial

motivation score, and final motivation score results of the experiment class and control class.

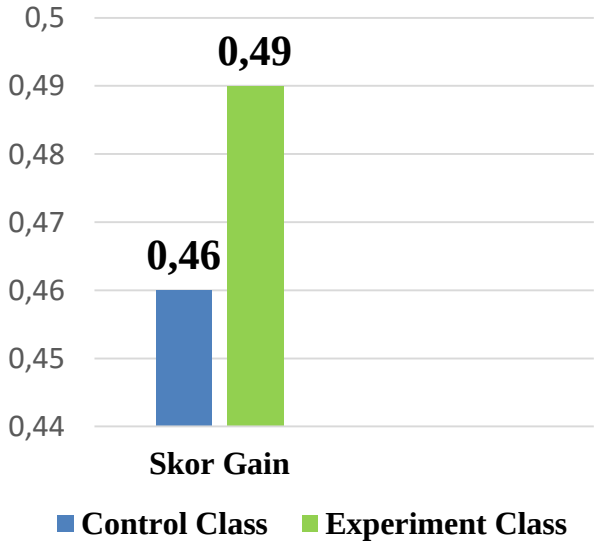
Conceptual understanding data

Diagram 1. The Averge of Pretest and Posttest from Both Classes



Based on diagram 1, the mean of experiment class is higher than control class but they were not significantly different. To know the increement of both class we see the score gain below.

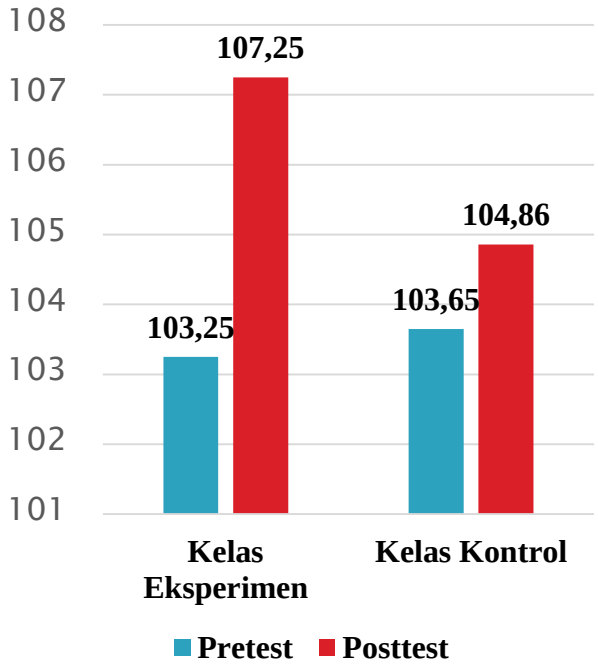
Diagram 2. Score Gain of Conceptual Understanding



From diagram 2, the increment from the experiment class is higher than the control class. To see the significant differentiation we should do hypothesis.

Learning motivation data

Diagram 3. Learning Motivation Results



Based on diagram 1, the mean of experiment class is higher than control class but they were not significantly different. To see the significant differentiation we should do hypothesis.

Analysis on the pretest, posttest, gain score, initial and final motivation value results of the control and experiment class showed that the classes were normally distributed. It was indicated by the significant value> 0,05. The variances of both classes were equal (homogenous), since the significant value was greater than 0.05.

The hypothesis were analyzed using one sample t-test and independent sample t-test to know the effectiveness of learning in the experiment class which given contextual approach using REACT strategy and the control

class which given conventional approach, and to know the difference between means of the two classes.

The first hypotesis was done to know the effectiveness of contextual approach in terms of conceptual understanding. Contextual approach effective towards conceptual understanding if the gain score is more than 0,40. This hypothesis were analyzed with t test i.e. one sample t-test by using spss 23. The significant value is 0,05. The result shown in the table 1 below.

Table 1. Effectivenes of Contextual Approach in Terms of Conceptual Understanding Result

Class	Variable	t	df	Sig
Contextual	Conceptual Understanding	8,940	27	0,000

Based on table 1 we can conclude that the contextual approach effective towards conceptual understanding. Learning by using a contextual approach provides an opportunity for students to be able to construct their own knowledge so that students can apply the concepts they have found in the context in their life. This result in line with the notion of contextual approach by Wina Sanjaya (2006: 109), contextual learning is an learning approach that foccused on the involvement of the students to find the material and relateit to the real life situations so students can apply it to their lifes.

The result also relevant with the reasearch that has been done by Esti Ambar N (2013: 104). The research shows that students who are given the opportunity to find their own mathematical concepts by completing various contextual matter will become more understand about the concept.

The second hypotesis was done to know the effectiveness of contextual approach in terms of learning motivation. Contextual approach effective towards learning motivation if the final score is more than 102. This hypothesis were analyzed with t test i.e. one sample t-test by using spss 23. The significant value is 0,05. The result shown in the table 2 below.

Table 2. Effectivenes of Contextual Approach in Terms of Learning Motivation Result

Class	Variable	t	df	Sig
Contextual	Learning Motivation	2,356	27	0,026

Based on table 2 we can conclude that the contextual approach effective towards learning motivation.

Learning motivation has an important role in clarifying learning objectives. According to Hamzah B. Uno (2008; 28) the role of motivation in clarifying learning objectives closely related to the maningfulf learning. This is in accordance with one of the characteristics of contextual learning expressed by Zainal Aqib (2013: 6) in the preparation of contextual learning, the first step is to develop the idea that the child will be learning more meaningful by the way of working themselves and construct their own knowledge and new skills.

Contextual approach is effective in terms of student learning motivation relevant with the reasearch that has been done by Syariful Fahmi, the result of the reasearch shows that there is a change in students' attitude toward anxiety, self-confidence, and interest in mathematics. This result also relevant to the research that has been done by Fitriyani (2009) which showed that

contextual approach effective to improve students' motivation.

The third hypotesis was done to know the effectiveness of conventional approach in terms of conceptual understanding. Conventional approach effective towards conceptual understanding if the gain score is more than 0,40. This hypothesis were analyzed with t test i.e. one sample t-test by using spss 23. The significant value is 0,05. The result shown in the table 3 below.

Table 3. Effectivenes of Conventional Approach in Terms of Conceptual Understanding Result

Class	Variable	t	df	Sig
Conventional	Conceptual Understanding	11,611	27	0,000

Based on table 3 we can conclude that the conventional approach effective towards conceptual understanding. Conventional approaches effective in terms of the understanding of mathematical concepts relevant to the research that has been done Dian Putri Safrine (2012) which shows that the conventional approach is effective in terms of understanding of mathematical concepts.

The fourth hypotesis was done to know the effectiveness of conventional approach in terms of learning motivation. Contextual approach effective towards learning motivation if the final score is more than 102. This hypothesis were analyzed with t test i.e. one sample t-test by using spss 23. The significant value is 0,05. The result shown in the table 2 below.

Table 4. Effectivenes of Conventional Approach in Terms of Learning Motivation Result

Class	Variable	t	df	Sig
Contextual	Learning Motivation	1,884	27	0,070

Based on table 4 we can conclude that the conventional approach effective towards learning motivation. The conventional approach starts from the teacher outlining the material to be recorded by the student, asking questions, the teacher answered, and ends with exercises as feedback (Herminarto, 2002: 65). Based on the characteristics of the conventional approach mentioned, conventional teaching will make students have the motivation to learn and understand the material well.

Conventional approaches effective in terms of student motivation relevant to the research that has been done by Fitriyani (2009) which shows that the conventional approach is effective to increase students' motivation.

Based on the results of the first until fourth hypothesis, we know that both approach effective in terms of conceptual understanding and learning motivation of the junior high school students. Then, to determine the effectiveness comparison of these two learning approach necessary hypothesis testing fifth and sixth.

The fifth hypotesis was done to know the the difference between gain score means of the two classes to know whether contextual is better to improve the conceptual understanding or not. This hypothesis were analyzed with t test i.e. independent sample t-test by using spss 23. The significant value is 0,05. The result shown in the table 5 below.

Table 5. Effectivenes Comparison between Contextual and Conventional Approach in Terms of Conceptual Understanding Result

Variable	t	df	Sig
Conceptual Understanding	0,485	54	0,630

Based on table 5 it can be concluded that the contextual approach is no more effective than the conventional approach in terms of conceptual understanding. It means that the differentiation on the means of gain score of both classes are not significantly diffirent. However, if we look from the means of gain score the increase of experimental class is higher than the control class. The result of fifth hypothesis is the contextual and conventional approach are equally effective to improve the conceptual understanding of junior high school students.

The sixth hypotesis was done to know the difference between means of the two classes to know whether contextual is better to improve the learning motivtion or not. This hypothesis were analyzed with t test i.e. independent sample t-test by using spss 23. The significant value is 0,05. The result shown in the table 6 below.

Table 6. Effectivenes Comparison between Contextual and Conventional Approach in Terms of Learning Motivation Result

Variable	t	df	Sig
Learning Motivation	0,544	54	0,589

Based on table 6 it can be concluded that the contextual approach is no more effective than the conventional approach in terms of learning motivation. It means that the differentiation on the means of both classes are not significantly diffirent. However, if we look from the means, the increase of experiment class is higher than the control class. The result of sixth hypothesis is the contextual and conventional approach are equally effective to improve the learning motivation of junior high school students.

CONCLUSIONS AND SUGGESTIONS

Conclusions

Based on the results of data analysis and the discussion, the conclusions are as follows

1. The mathematics learning with contextual approach is effective in terms of conceptual understanding.
2. The mathematics learning with contextual approach is effective in terms of learning motivation.
3. The mathematics learning with conventional approach is effective in terms of conceptual understanding.
4. The mathematics learning with conventional approach is effective in terms of learning motivation.
5. There is no significant difference in terms of conceptual understanding between students who participated in mathematics learning with contextual approach and students who participated in mathematics learning with conventional approach.
6. There is no significant difference in terms of learning motivation between students who participated in mathematics learning with contextual approach and students who participated in mathematics learning with conventional approach.

Suggestions

Based on the results, then the suggestions of the researcher are as follows.

1. For other researchers, to anticipate for the things that might happen during the research, to maximize the observation of the research, and to add variables when conducting research related to this topic.
2. For the school, to apply contextual approach approach using REACT strategy in the learning process as one of the alternative learning to increase the conceptuala understanding of students in SMP Negeri 2 Depok.

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