Analysis of students’ incorrect answers at triangle materials in the fifth-grade of primary school

E Shintawati* and Al Jupri
Department of Primary Education, Postgraduate of Indonesia University of Education, Indonesia.

*Corresponding author’s e-mail : shintawati24@gmail.com

Abstract. This research aims to analyse the comparison of the predictions made by the author between learning methods with the reality that occur in the class and to analyse students’ responses toward questions given by teachers at triangle materials. The method used in this research is the descriptive-qualitative method. The subjects of this research are all fifth-grade students from a primary school in the city of Bandung. The results of this research indicated that there are some influences between learning methods and students’ responses shown by the way students answer the question. In reality, there are many students’ responses produced beyond the predictions of the author. It shows that as the good teachers, besides setting up learning methods, they should also make predictions toward the responses of the students in answering the questions given. The results of the predictions could be used as a lesson for teachers to run the learning processes as good as possible so the students’ responses could being accordance with the concept of materials presented and could also achieve the expected learning goals. Based on this research’s results, as a teacher must have techniques and strategies to overcome things that are not expected during the learning so that learning can be conducive so that students can focus on learning and enjoy learning so that learning outcomes is the ability of students to increase in understanding the material and can construct the concept of material provided.

1. Introduction
Mathematics is an important science in supporting other science, so that in learning in every class of subject mathematics has a longer time than other subjects. The current negative paradigm of mathematics is regarded as a difficult lesson and makes students less fond of math.

Mathematics is a tool for developing ways of thinking. But the mathematics that exist is essentially a science that way deductive formal and abstract reasoning, should be given to the children since elementary school that way of thinking is still at the stage of concrete operations [1].

Gagne [2] in learning mathematics there are two objects that can be obtained students, namely direct objects and indirect objects. Indirect objects include the ability to investigate and solve problems, learn independently, be positive about mathematics, and know how to learn. While direct objects in the form of facts, skills, concepts and rules.

Besides referring to the theory of Gagne this research also refers to Piaget, learning theory Piaget [3] learning more determined because of the existence of individual initiative. Where in the arrangement of conditions not as the cause of learning as proposed by the flow behavioristic, but simply facilitate
learning. Student activeness becomes a very important element in determining the success of learning. Independent activity is a guarantee to achieve optimal learning outcomes.[3]

The author predicts in this learning the teacher design the learning using CTL approach. CTL is a direct learning that connects teaching materials with students' real life. This is supported by the opinion of [4] states that "CTL is a learning approach that connects concepts with the context, so that students gain a number of meaningful learning experiences in the form of knowledge and skills".

So the prediction of learning material of flat triangle building with CTL approach can make meaningful learning and make students active and enjoy learning mathematics.

Flat building is a geometry building whose whole part lies on one plane. Also called a two-dimensional geometry, where the wake flat can be seen and held. [5] in his study grouping the type of flat wake in terms of side can be classified into two types, namely the flat wing arched and straight curved. Build a flat-sided arch such as circles, ellipse. Build flat with straight sides, among others, triangle, square, rectangle, kite, parallelogram and others.

In the observations made by the flat wake writer who studied the triangle. Triangle is a flat wake built by three sides. There are triangles, including right triangles, equilateral triangles, equilateral triangles and even triangles. Triangle determination can be seen based on equal length and big angle.

2. Methods
To address the research question, author conducted a qualitative study which an individual written test on triangles. Data were collected through exploration ability of primary students on scales materials. The subjects of the research were 45 fifth-grade students from one of primary school in the city of Bandung.

First of all, before learning process was happened, researcher do some predictions about learning strategies which is used by teacher and some predictions about strategies which is used by students to answer questions from the teacher. Then when learning process happen, researcher doing comparison between predictions and the facts. Finally, researcher doing analysis and give some recommendations about it.

3. Result and Discussion

3.1. Analysis of Strategy
After making observations, we tried to compare the prediction of teaching method and the reality that occurs in the classroom. The comparison between predictions and the reality is presented in the Table 1.

| Learning Model | Prediction | Fact |
|----------------|------------|------|
| Model          | Cooperative| Classical |
| Approach       | CTL        | Scientific |
| Method         | Demonstration| Demonstration |
| Technique      | Scaffolding | X |
| Strategy       | Heuristik   | X |

Based on the observations, the learning model used is a classical model. This is different from predictions that have been made before. Previous researchers predict the model used is a cooperative model. Because by using a cooperative model students can learn in groups and exchange ideas so that students can be active in learning. In the fact the teacher uses a classical model, because this model is most easily done considering the number of students in the class is 45 students. With so many students, teachers are required to deliver material as best and maximum as possible. So that classical learning will make it easier for teachers to organize lesson material and easily absorbed by students.
The learning approach used by teachers is the scientific approach. This is different from predictions that have been made before. The reason teachers use this approach because the scientific approach to learning designed in such a way can make learners actively construct the concept through observing stages that function to identify or find problems, formulate problems, formulate hypotheses, collect data with various techniques, analyze data, Draw conclusions and communicate the concepts he has designed.

The learning methods used by teachers is a method of demonstration. This corresponds to predictions that have been made before. The reason teachers use this method is because the method of demonstration is the application and the oral narrative using the teacher's appropriate tools to the students. The use of this method can help teachers in maximizing time and learning goals. Teacher did not use learning technique. This is not consistent with the predictions that have been made. And teacher did not use learning strategies. This is not consistent with the predictions that have been made.

3.2. Analysis Students Response to Questions by Teacher
After doing predictions about students' responses to questions which is provided by the teacher, the researcher analyzed the students' response which is accordance with the results of observations that have been made. Beside of that, the researcher explained about the possible reasons why the students answer the question, how many students answered precisely and less precise, as well as the comparison between predictions and reality. Problems which is given by the teacher are 5 questions but the researcher analyzed at question number 1. The elaboration of predictions and reality is presented in the Table 2.

| Problems | Prediction(s) | Students’ Actual Answers | n/N |
|----------|--------------|--------------------------|-----|
| 1. Mention the various triangles based on the large angle! | 1. Taper angular triangle 30° 2. Dull angular triangle 100° 3. An equilateral triangle whose angle is 60° 4. An arbitrary triangle with its various angles 5. The equilateral triangle of the angle is 80° 6. Ordinary large triangle angle 39° | Students who can answer correctly are 34 students |   |
| Problems | Prediction(s) | Students’ Actual Answers | n/N |
|----------|--------------|--------------------------|-----|
| b. | Dull triangle that magnitude more than 90°, as follow: | | |
| c. | Right triangle The right triangle of elbows 90°, as follow: | | |

3.2.1. *Analysis Question Number 1.* Based on observations of the student responses on problem 1, provided by the teacher, we found that almost all students answered correctly. The right answer is in accordance with the prediction of a response, which in fact as many as 34 students right in doing the answers. Students have understood triangles based on large angles and some students still don’t understand to it.

In the first answer and the two students have understood that the triangle can be distinguished by its large angle so that in giving the student answer it shows the big angle according to the intended triangle. For the third answer the student has not understood the triangle by angle, the student gives the answer about the triangle based on the length.

For the answers to the four students still do not understand the triangle by angle, but the student knows the triangle type. The student is still confused about triangles based on angles and triangles based on length.

For the fifth answer is the same as the second answer that students have not been able to distinguish triangles by angle and length. For student answers to the six students are not yet understand and remember the kind of triangle.

Based on observation result of student answer factor is wrong because teacher give less student to find its own concept and look for other source beside from teacher. But in this study the teacher shows only a picture and the students are only asked to answer and determine the vertices and sides of the triangular flat wake. Then after that the students are given a matter of practice and after that given the question of evaluation. In this learning there is no group learning, so there is no interaction between students to be able to conclude and develop good language skills and true. Because when the question and answer only certain students who can communicate what he knows.

4. **Conclusion**

Prediction of the researcher’s use in learning mathematics of constructing this triangular flat matter using CTL approach. The CTL approach is a learning that links the material to be learned to the student's life situation. CTL approach makes students become more understandable because the teaching material is associated with real life that makes students become more enjoyable learning and learning becomes meaningful. Based on the observation of the mathematical learning of the triangular flat waking material.
using a scientific approach. Scientific learning can be a good learning when teachers can do well by following procedures and making learning fun for students. Scientific approach is a learning designed in such a way that learners actively construct the concept through observing stages that function to identify or find problems, formulate problems, formulate hypotheses, collect data with various techniques, analyze data, draw conclusions and communicate concepts Which he has designed. Therefore, the design of learning before the start of learning should be designed as possible. As a teacher must have techniques and strategies to overcome things that are not expected during the learning so that learning can be conducive so that students can focus on learning and enjoy learning so that learning outcomes is the ability of students to increase in understanding the material and can construct the concept of material provided.

5. References
[1] Herman H 2003 Common Textbook (Edisi Revisi) Pengembangan Kurikulum dan Pembelajaran Matematika (Semarang: Universitas Negeri Malang)
[2] Tim MKPBM 2001 Strategi Pembelajaran Matematika Kontemporer (Bandung: Penerbit JICA-Universitas Pendidikan Indonesia/UPi).
[3] Budiningsih A 2015 Belajar dan pembelajaran (Jakarta: Rineka Cipta)
[4] Dimyati M 2006 Belajar dan pembelajaran (Jakarta: Rineka Cipta)
[5] Sahimuddin 2010 Meningkatkan Hasil Belajar Matematika Siswa Pada Materi Luas Bangun Datar Melalui Pengunaan Media Pembelajaran Pada Kelas V SD Negeri 6 Katobu Kecamatan Duruka Kabupaten Muna (Kendari: Universitas Haluoleo)

Acknowledgements
We thank students and teacher who participated actively in this research.