How Is The Understanding Profile Of Rectangle And Square Concept Of The Male Deaf Student In The First Grade Of Inclusive Junior High School

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ABSTRACT
The purpose of this study was to find out how is the understanding profile of rectangle and square concept of the male deaf student in inclusive class junior high school. The subject in this study were only one deaf male student of class VII. The data of this study were analyzed using time triangulation. The results of the research analysis male deaf student understanding is 1) subject can interpret the objects around which he observed directly as a representation of rectangle and square and were unable to mention objects that could only be imagined on the grounds, 2) Student giving examples in the form of drawings use a ruler but the drawings that have been drawn are not exactly sized and the angles formed are not right angles, 3) student classify rectangle and square made of cardboard as a whole not perfect, 4) student can mention the characteristics of rectangle and square, 5) student wrote the definition based on the characteristics of the rectangle and square, 6) student did not find similarities of rectangle and square only differences of rectangle and square, 7) the student cannot express causal relationship between rectangle and square because he considers the two shapes to be different.

Keywords: Understanding, deaf student, rectangle and square concept

Introduction
One of the basic human right that need every person is the acquisition of education to be able to compete in all fields of life without discriminating with one another, including those who have physical disorders. Since 2004 the concept of inclusive education that began with the Bandung declaration which was then carried out in detailed the implementation of this inclusion education was set in Permendiknas No. 70 of 2009, which aims to, 1) provide the broadest opportunity for
all students who have physical emotional, mental and social disabilities, or have the potential
intelligence and or special talents to obtain quality in accordance with their needs and abilities,
2) realize the implementation of education that respects diversity and non discriminatory for all
students with special needs, 3) build character attitudes and norms for all students in the schools
of inclusive education providers (Technical Guidelines for the Implementation of East Java
Inclusion Education 2012).

In the regulation of the minister of national education number 70 of 2009 article 1 (one) it
is mentioned that what is meant by inclusive education is a system of providing education that
provides opportunities for all students who have disabilities and have the potential for
intelligence and / or special talents to attend education or learning in one the environment
together with students in general [1].

Meanwhile, Staub and Peck in [2] states that inclusive education is the placement of
children with mild, moderate and severe disabilities in full in regular classes. Sedangkan [3] state
that in inclusive school children with special needs can socially interact with normal children so
that the disruption they have experience will be reduced. From the above statement it can be
concluded that inclusive education is an educational concept that does not distinguish general
students from students who have disabilities or children with special needs.

But the reality in the implementation of inclusive education is not yet fully in line with
expectations, this is due to the lack of understanding from the school towards the concept of
inclusive schools. This can be seen from schools that have inclusive labels, but in practice it still
does not reflect the existence of inclusive learning conditions for students with special needs. [4]
states, in his research on the phenomenon of the implementation of inclusive education for
children with special needs concluded that the reality in the field of inclusive education is not all
in accordance with the guidelines for administration, both in terms of student condition s,
teacher qualifications, supporting facilities and infrastructure, parent support and support from
central and local governments.

In the inclusive class, students with disabilities will learn the same material as other
students in accordance with the curriculum that applies to inclusive school. One of the subjects
contained in the curriculum is mathematics which is studied at every level of education in
Indonesia. Mathematics is one of the fields of science related to human activities in daily life
[5]. But this math lesson is also often a scourge for most students, if general students find it
difficult to learn mathematics especially students with disabilities. Mathematics educators we
realize that learning mathematics requires a good delivery by a competent teacher to provide
understanding in learning mathematics.

Understanding is one of the cognitive processes [6], if students' understanding of teaching
material is good it will give good results. [7] states that a person is said to understand if he/she
can construct meaning based on learning messages that include oral, written and graphic
communication, therefore a good understanding if someone is able to make connections between
mental mathematical representations [8], while [9] states, understanding mathematics is
understanding something means making connections. Psychologically it connects with previous
understanding called cognitive schemes or structures.

Geometry is one area of mathematics that discusses the concepts of points, fields and
space. [10] states geometry is a complex mathematical material. This area of mathematics has been taught from elementary education until university. The depth of the material and the learning approach are adjusted to the characteristics of the level itself. Geometry teaching materials in the seventh grade junior high school in the 2013 curriculum specifically geometry material is limited only to the introduction of the material properties and shapes of geometry, so in this study the focus is on rectangle and square.

Previous studies regarding the understanding rectangle of student with hearing impairment only used 4 category based gender in SMPLB, firstly summarizing, both subjects mention the characteristics of rectangle, secondly inferring, male subject give the definition of a rectangle according to the rectangle characteristics while female subject donot give answers, third, male subject is more creative in giving examples of objects around which are rectangle shapes, while female subject is only able to mention fewer objects that look like rectangle shape, and fourth both subjects placing objects based on the name [11] this research was develoved into seven category in inclusive class. The understanding referred to in this study is a person's mental activity in interpreting, exemplifying, classifying, summarizing, inferring, comparing, explaining [6].

**Research Methods**

**1.1. Subject and Research design**

This study only involved one male deaf student who sat on an Inclusion Middle School, the subject was given the name Ali (pseudonym), had a moderate level of disability, he still had hearing rest based on audiology test results with an IQ score of 85. The result of this study cannot be generalalized, but only infer actual phenomena in the field according to the research objectives. Design activities by giving sheets tests to the subject of geometrical including rectangles and square, because the student has a disability when they already working one question directly interviewed based on the answers that have been completed to know student understanding of rectangle and square.

This research was qualitative using a descriptive and explorative method. This approach was selected because explorative data must be natural and deep in the from of words or using sing language, gestures, facial expression, and written answer. The approach was categorized as qualitative, while this type of research is descriptive explorative research [12]. This study was conducted to explore how and what deaf student can display through sign language, images or symbols when expressing their understanding of the concepts about rectangles and squares. Furthermore, the data was described to obtain a realistic view of deaf student understanding of concepts relating to rectangles and square.

**2.2 Instrument**

The instruments used in this research included achievement, interviews, and video recorder. The achievement test consisted of essay format question that had been validated by one math specialist from the state university of Surabaya East Java province of Indonesia and a math teacher from Inclusive Secondary School consisted of 7 questions: interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining plane geometry that include
rectangles and squares.

2.3 Collection and Analysis Data
Data collection was done by using task-based interviews. The subject of this study worked a quadrilateral problem by writing answer on the answer sheets provided and revealing what he was thinking at the time with a loud voice. If the subject did not reveal his thinking processes with oral interviews and sign language, the researcher would ask question to clarify what the subjects was thinking to explore the process of student understanding by using oral and. Because the subject is deaf student the data collection process cannot be compared when the research subjects are normal students.

Analysis of the data used the answer sheet of subject, the transcripts from the video recording and interpretations of the subject behaviors while subject solve the problem. student participating in the lesson. The data was categorized into seven categories, interpretation, exemplifying, classifying, summarizing, inferring, comparing, and explaining.

Results and Discussion

3.1 Result
This study reveals the subject's understanding of rectangle and square. The categories of understanding investigated is the subject understanding in interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining rectangle and square. First, Ali reads statements with low voice while emphasizing certain words. He read the statement while pointing, after reading the statement he observes the picture of a quadrilateral that has been given then refers to picture that includes a rectangle and a square. Then he read questions related to

Interview researcher to the subject
This subject is one of the male student who have a moderate level deaf in inclusive class.

Interpreting Category.
Researcher: Do you understand the meaning of the question? Subject:
(shaking head)
Researcher: You are asked to name things around you that look the same as rectangle and square
Subject: (Ooh, smiling and then mentioning objects that look the same as rectangle are tables, windows, and structure boards while objects that look the same as square are ceramic and locker doors
Researcher: Mention an object that is in another place, which looks the same as a rectangle and square
Subject: (Shaking head) does not exist because it’s not visible

Exemplifying Category
Researcher: Can you draw a rectangle and square? Subject: (Nodded then draw with a ruler)

Researcher: whether the picture you drew is a rectangle
Subject: yes, because the picture is the same as a rectangle, there is a long line

Researcher: whether the picture you drew is a square
Subject: yes because the lines are the same

Classifying Category
In this category the subject asked to group quadrilateral that have been coded in the column provided.
Researcher: Grouping the object into columns provided according to the quadrilateral names
Subject: Ok I will group it according its name (while observing one the code that has been given and then write in the appropriate column)
Researcher: Pay attention to the R code (get a rectangle with a difference in length of the adjacent sides of 2mm) why you put it in the square column
Subject: (pauses while observing then says) because of the lines are the same.

Summarizing category
In this category subject was asked to write the characteristics of rectangle and square
Researcher: Mention as many characteristics as possible of the rectangle Subject: (observing a rectangle then says) two long lines and two wide lines Researcher: Mention as many characteristics as possible of the square
Subject: (observing a square and then says) has 4 lines of equal length.

Inferring Category
In this category, subject was asked to write the definition of rectangle and square
Researcher : According to you, what is a rectangle (what definition of rectangle) 
Subjek : He said, rectangle has two long lines and two short lines, while square has four sides same size.

Comparing Category
In this category the subjects compare by mentioning the similarities and differences of rectangle and square
Researcher : What are the similarities between rectangle and the square Subject : (Speechless while observing then said) did not exist because both are different (rectangle and square are different) Researcher : What is the difference between a rectangle and a square? Subject : He said, rectangle has two long lines and two short lines (while feeling the long side and the rectangle width) while square has lines are the same length (touching the sides of a square).

Explaining Category
In this category subject was asked to find the causal relationship between rectangle and square 
Researcher : Whether a rectangle can also be called a square, why? Subject : Can’t, because of different rectangle and square 
Researcher : Whether a square can also be called a rectangle Subject : Can’t, because of different square and rectangle

3.2 Discussion
In the present study, we want to reveal the understanding of deaf subject of this study we have obtained. The subject involved only one person with the characteristics of the subject had a moderate level of disability. Based on the subject answers and the way reveal it can be understood that there are many different ways deaf subject expresses then hearing subject how to read and find solutions. But subject tried to give answers in accordance with the abilities and understanding.

Interpreting category, subject can interpret surrounding objects as rectangle and square only be observed directly but cannot interpret objects that only be imagined, shows that the subject is less creative if the object only be imagined. [13] states that creativity is an important aspect of intellectual functioning. Even though the subject is not creative in finding objects that can only be imagined, but subject can point to objects that directly observed as rectangle and square shapes. According to [14] interpreting is when the student classified to be able to interpret an idea to different form.

Exemplifying category, subject has drawn rectangle and square even though using a ruler in drawing, it appears that the drawings on the lengths of the different sides show that the subject does not pay attention to the length of the sides and the angles are not exactly 90 degrees after being measured. The first rectangle has a length difference one side facing the difference is 2mm but the subject uses the perception that the rectangle he has drawn is a rectangle by stating the reason for the picture has long line in this case the subject associates the
line with the side. From the answers of these subject showed that by using visual image, the subject is not creative using a ruler to measure length of the sides but only observing briefly so as to think the same length. [15] states based on assessment figural TTCT research findings based on the TTCT figural assessment are also conflicting. the majority of studies suggest that deaf children may be more nonverbally creative than hearing children as well as [16] states Deaf students may be more creative in the figural domain because of strengths in their visual-spatial skills.

Classifying category, subject placed the coded in the column provided but there was a rectangle with adjacent side difference of 2 mm but the subject placed the code in the square column. The subject did not use the ruler to measure only using perception with length of quadrilateral. Summarizing category, subject is only able to mention the characteristics of a rectangle that has two long sides and two wide sides while the characteristics of a square has 4 sides of the same size, subject not found other characteristics of rectangle and square. Gimenez, J and Rosich N states, the deaf student low ability to generalize the nature of geometry.

Inferring category, based on subject answer, he did not know formal definition of rectangle and square only he said the same answer with summarizing category. This is consistent with the statement [18] states deaf children generally are foud to have smaller English vocabularies than hearing peers, so that it will affect the ability to reveal something, likewise [19] states that reading skills deaf student can interfere with the development of verbal thinking skills. [11] the result of the study at SMPLB showed that male students could not mention verbal definition of rectangle In the comparison category, subject in this category do not mention similarities between rectangle and square only mentions the differences. The subject considers the two shapes are different. In explaining category, according to subject that rectangle can’t called square. subject in this category did not express verbally a causal relationship between rectangle and square because the subject assumed that two shapes were different.

**Conclusion and suggestion**

Male deaf student can interpret objects around as a representation of rectangle and square, but the subject only represents objects that can be directly observed. Subject can give examples in the form of rectangle and square but the subject does not utilize a measuring instrument so that the shapes drawn on the sides do not have the same size and the angles are not exactly 90 degrees, subject classify rectangles that have been coded but the subject does not measure the length of the sides so that there are rectangle that are only 2mm apart from adjacent sides placed in columns of square, subject mention the characteristics of rectangle and square only from the number of sides the shape has. Comparing category, subject did not find similarities between rectangle and square only mentions the differences, in the explaining category did not find a causal relationship from the rectangle and square. It can be concluded that the subject understanding of rectangle and square not all categories of understanding are answered by the subject as expected. However, this study cannot be concluded in general because it only uses one subject.

It is recommended for educator in inclusive schools to provide learning service and pay attention to the development of student with disabilities so they get the expected knowledge.

The results of this study can be used as consideration for improving learning in inclusive
school.

The present study is limited in terms of the generalizability of the subject included only one subject level Junior High School Inclusive class.

References


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