

DIFFICULTY ANALYSIS OF THE NINTH GRADE STUDENTS OF SMP 2 PUNDONG IN SOLVING THE CONGRUENCY TOPIC IN NATIONAL EXAMINATION

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Abstract. Until nowadays, national exams are still held every year. Based on the result of National Exam in 2015, one of the national exam questions which is difficult is the question of congruence. This study aims to find out the kinds of difficulties and factors causing the difficulty of class IX students of SMP 2 Pundong in completing the national exam questions about congruency. Difficulties that want to be known to berelated to concepts and principles in equality. The research method used is descriptive qualitative. The research subject was selected based on the students' errors in completing the similarity diagnostic test given to them. Qualitative data is collected from the documentation and interview results. Data analysis was carried out qualitatively. The results of the analysis show that student difficulties include: difficulty interpreting information in the problem, difficulty understanding concepts and principles in congruence, and error operating. The difficulty of students in solving problems of congruence concerns the weakness of understanding concepts and principles in congruency. Factors that cause student difficulties, namely a lack of variation in the exercise of congruency problems that link all concepts taught to students.

Keywords: *Difficulties Students, National Exam, Congruency*

1. Introduction

National exam is one process measurement and assessment of learning outcomes that have been implemented nationally in Indonesia began in 1985 organized by the government in order to measure the success of student learning. The research topic is important because congruence is one of the difficult topics in the national exam.

One of the lessons included in national exams is mathematics. Mathematics is one of the compulsory subjects that have been taught early (R. Soedjadi, 2000: 7). Therefore this lesson is taught at the primary and secondary education levels. At the junior secondary level (SMP) grade IX students will face a national exam. One indicator tested is to determine the comparison of equality.

Congruency is one of the difficult questions for students of SMP Negeri 2 Pundong. This is seen from the results of absorptive capacity (Puspendik, 2015) on average students in the topic congruency of SMP 2 Pundong 24.19% (school), 30.50% (Regency), 40.70% (province), and 39.38% (national). Difficulties experienced by students will allow errors to occur when answering test questions (Soedjadi, 1996: 27). In other words, mistakes made by students in answering test questions are indicators of the difficulties they experience. Ministry of National Education in 2007 also states that if a student experiences difficulties, then he will make a mistake. Difficulties of students in learning mathematics because students do not build themselves about knowledge of mathematical concepts but tend to memorize mathematical concepts without knowing the meaning contained in the concept so that when students solve mathematical problems students often make mistakes and find no solution to the problem. In line with the results of research conducted by Tulus Aprianto (2012: 18) in SMP PGRI Banyubiru revealed that there are four dominant error classifications, namely carelessness or inaccurate errors of 66.67%; process skill error of 26.04%; due to understand the problem of 4.17%; error using a notation of 3.13%.

Therefore researchers will explore about in any case, what types of cohesiveness did the student and actor experience which was the cause of the error of the 9th grade students of SMP Negeri 2 Pundong in solving the congruency problem.

2. Research Method

The research instrumen are the question of conruency, the students work result, and result interview. The type of this research method is descriptive-qualitative research. This is reviewed based on the type of problem (problem) in the study, which functions to determine the status and describe the phenomenon. Whereas if viewed according to the emergence of variables, this study includes non-experimental research because no *treatment was* carried out in this study.

The experiment was conducted in class IX SMP Negeri 2 Pundong the school year 2016/2017 and carried out in October - November 2017. The subjects were students of class IX SMP Negeri 2 Pundong who have difficulty in solving problems of the congruency topic. The sampling technique used was *purposive sampling*, which is the data source sampling technique with certain considerations in accordance with the objectives to be achieved. The classes used as research subjects were selected based on the results of learning observations, the results of the daily results of the congruency topic, the results of discussions with the mathematics teacher who were most suitable for collecting data with certain considerations. Next, several students were chosen to be subject to interviews based on the test results diagnostic congruence, math teacher's considerations and suggestions. Many students selected are tailored to the data needs needed and in accordance with the types of difficulties students do.

The research procedure refers to Lexy J. Moleong (2007: 127). Simply put, the design of this study as follows: (1) Pre-research, (2) Phase research, and (3) Qualitative data analysis.

3. Results

In this research, the questions used as a test for students are the national exam questions in 2016 and 2017 as follows:

Problem 1

"River width"

Andi wants to know the width of the river. Across the river is a tree. For this reason, he sticks the stick in positions A, B, C and D with a size like the picture:

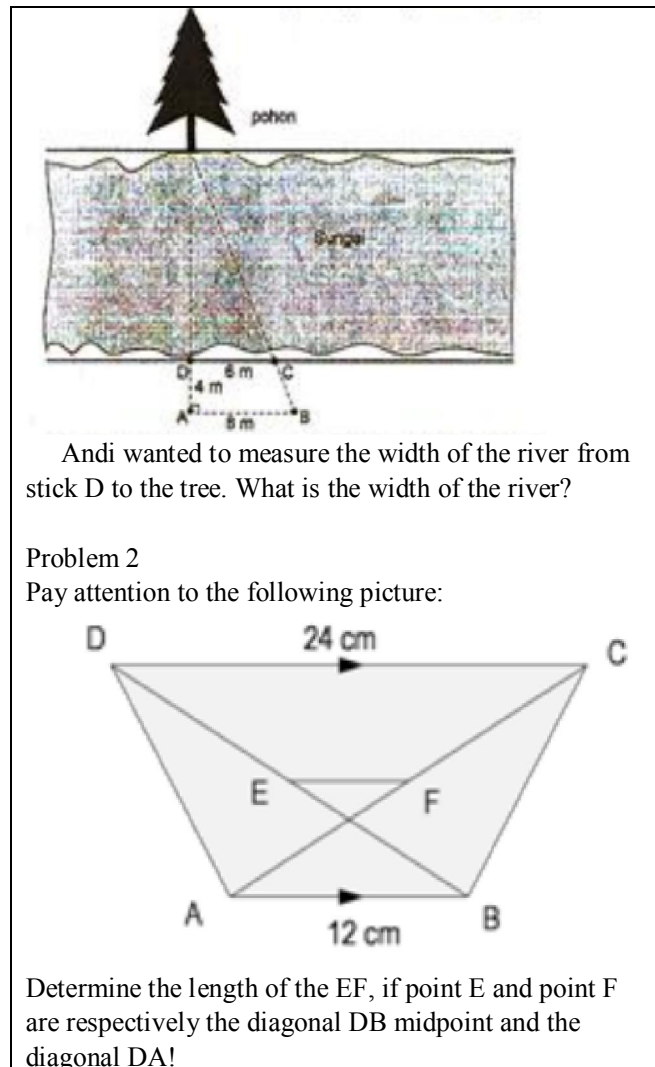


Figure 1: Test Questions

Based on the research conducted, researchers can identify students' mistakes in solving similarity problems. These difficult were made while working on diagnostic tests and deepened with interviews with students. The types of mistakes that students make are as follows:

1. Reading error
2. misconceptions
3. Error mentrans formasikan
4. Mengo error of Cooperatives
5. Errors due to carelessness

The reading difficulties are very crucial when solving a problem because if you experience a wrong reading you can be sure the next step is wrong and you will find the wrong outcome. This was raised by Yulinda in Yuliana (2010: 43) who said the inability to remember things that were seen or heard or experienced were called memory disorders. Students with visual memory problems can have difficulty recalling visually displayed words. In other words, this difficulty results in errors in the next step .

Errors in aspects of language are divided into several indicators, namely (1) students are not able to read the questions correctly, (2) students do not understand the meaning or meaning of the story in the problem, and (3) the inability of students to retell with their own language. The ability to read questions appropriately needs to be owned by students so as not to make different interpretations for those who listen. This is comparable to Auzar (2013: 34). Reading is essentially a complicated process that involves many things, not just reciting writing, but involving visual, thinking, psycholinguistic, and metacognitive activities. Therefore, it is not enough with the right reading skills, but it is necessary to pay attention to the definition of true reading, namely a process that involves many things, not just to recite writing, requires interpretation and understanding so that students have good language skills .

Following are the mistakes made by students:

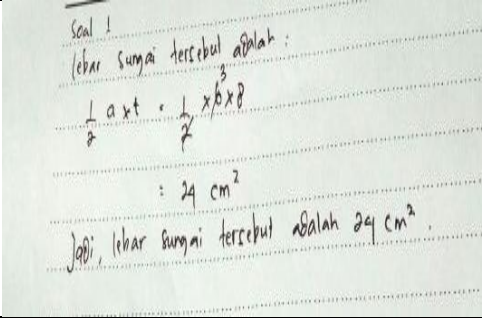
Student Answer

Interview
<p>P: "Try to explain your answer to me"</p> <p>S1: "I consider the width of the river to be the same as the area of the trapezoid"</p> <p>P: "Why can the width of a river be the same as the area of a trapezoid?"</p> <p>S1: "Hmmm ... I'm confused sir "</p>

Figure 2. Student errors 1

Based on the work of the S1 and confirmed from the interview, that the child experienced an error in understanding the concept. The child considers that the width of the river is the same as the area of the trapezoid. That may be because in the question that appears to be known the size is in the wake of ABCD, so the child immediately operates the numbers. In fact, to solve this problem is the concept of congruence so that it can be found the length of DE which is none other than the width of the river. In addition students also experience errors in transforming the problem into an appropriate mathematical model. The next mistake is that students make mistakes in reading the problem. In the question asked the width of the river which should be the unit width is equal to the unit of length. While the conclusions of students write the width of the river with the unit area.

It turns out that errors in answering number 1 questions were also carried out by other students (S2). Following are the answers of S2 students:

Student Answer 2 for problem number 2
Interview
<p>P: "Try to explain your answer to me"</p> <p>S2 : " In my opinion, to answer the question using the triangle area formula."</p> <p>P: "Why do you use the area of a triangle?"</p> <p>S2: "Because the width of the river is the same as the triangle area of CDE"</p>

Figure 3. Student Error 2

From the results of S2 student work and interviews, several errors can be identified. Among them are mistakes due to carelessness. This can be seen in entering the triangle area formula using the trapezoidal formula. And mistakes in understanding the concept of equality are experienced by S2 because they consider the area of a triangle equal to the area of a trapezoid.

Student Answer 3 for problem number 2
Interview
<p>P: "Try to explain your answer to me"</p> <p>S3 : " In my opinion, the length of the EF is immediately sought by the ratio of large trapezoidal and small trapezoid "</p> <p>P: " Oo mean you solved the problem with a ratio of 2 trapezoidal ?"</p> <p>S3 : "Hmmm ... yes sir</p> <p>P: "Why can it be like that?"</p> <p>S3 : " I told you that sir"</p>

Figure 4. Student Error 3

Based on the results of the S2 work, several student errors can be analyzed. Among them students do not understand the concept of congruence. This is evidenced by the students' answers which say that the problem was solved by a large trapezoidal ratio and a small trapezoid. The large trapezoid in question is an ABCD trapezoid and a small trapezoid is a CDEF trapezoid. The mistake of giving a quote is that the student is wrong in the division operation. It appears in the students' answers that the results are from $\frac{432}{12} = 26$.

Even though the results are from $\frac{432}{12} = 36$.

The results of 26 according to students are definitely not the length of the EF, because when viewed from the picture, the length of the EF is shorter than the length of the DC and the length of the AB. So students consider the length of the EF from $26 - 24 = 2$. The length of EF is sought from the length $AB - 2 = 12 - 2 = 10$.

Another mistake in the answer to question number 2 is done by the S2 as follows:

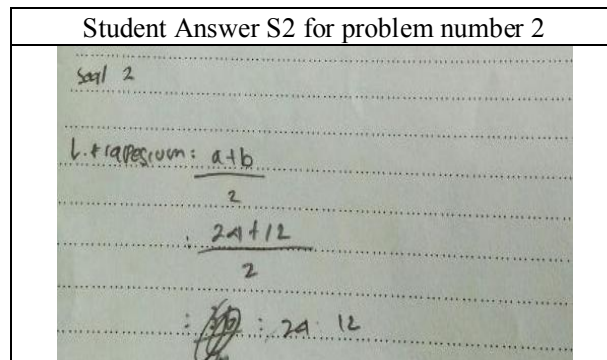


Figure 5. Student Error 2

From the results of the S2 answers above, he was wrong in reading the questions. This was shown by students using the trapezoid area in answering problem number 2. Though the request for questions determines the length of EF by using the concept of equality.

In addition to knowing the types of errors made by students, based on student interviews found factors that cause errors, including the following:

1. Lack of guidance in learning and exploration in learning
2. Lack of variety of questions
3. Learning is less related to everyday life
4. Students do not master the prerequisite material
5. Students are less active in learning activities
6. Students lack understanding of the concept

4. CONCLUSION

4.1 Conclusion

The types of mistakes that students make are as follows:

1. Students misread the problem
2. Students misunderstand the problem
3. Error in modeling mathematical problems

4. Error in algebraic counting operations
5. Errors due to carelessness

The factors that cause errors include the following:

1. Lack of guidance in learning and exploration in learning
2. Lack of variety of questions
3. Learning is less related to everyday life
4. Students do not master the prerequisite material
5. Students are less active in learning activities
6. Students lack understanding of the concept

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