



Analysis Of Student Errors In Solving Mathematics Olympiad Questions For Ambon Catholic Junior High School Students Based On Learning Style

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ABSTRACT

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Student achievement in the national science olympiad in mathematics needs to be improved. One way that can be done is to describe the types of student errors in solving math OSN problems. And the learning styles of students. The research subjects were representative students from Ambon Catholic Junior High School for the Mathematics OSN at the district/city level, totaling one person. Data collection techniques were carried out by giving tests in the form of descriptions, interviews, and learning style questionnaires. The results showed that students made errors based on Newman's analysis, namely, reading errors, understanding questions, and transforming errors once each, processing skills errors and writing errors in the final answer 4. The results of the learning style questionnaire, students have a visual learning style. Some recommendations based on the results of this study are teachers need to provide assistance to students by paying attention to student learning styles.

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1. Introduction

The National Science Olympiad (OSN) is an ongoing olympic activity organized by the government for students from Elementary School or equivalent, Junior High School and equivalent where clumps of science that are contested which have objects in the form of natural objects, definite and general laws and apply anytime and anywhere. OSN was first held in 2002 in Yogyakarta. Furthermore, it is held every year in various different cities in Indonesia. The cities that hosted OSN from 2003 to 2019 were as follows: Balikpapan, DKI Jakarta, Semarang, Surabaya, Makassar, DKI Jakarta, Medan, Manado, DKI Jakarta, Bandung, Mataram, Yogyakarta, Palembang, Pekanbaru, Padang, and Manado.

In 2020 the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek) will continue to hold the National Science Olympiad competition, only to change its name, namely the National Science Competition (KSN) for SD/MI, SMP/MTs, and SMA/MA students. In 2020, the implementation of activities changed which are usually carried out offline (outside the network) to online (in the network due to the covid-19 outbreak that hit Indonesia). Every year there are never few students interested in KSN, for 2021 the number of participants reaches more than 2000 students with a composition of students There are more than 500 SD and equivalent, SMP and MTs level students exceed 700 participants and SMA/MA students have the highest number of 900. The entire selection process is held online (on a network) due to the covid-19 outbreak that has hit the world, including Indonesia [6].

The National Science Competition will be held on November 7, 2021 and will end on November 13, 2021. The theme for the National Science Competition in 2021 is "Science Talents for a Tough Indonesia" The selection for the Olympics starts from the next school level to the district/city then provincial level. and national. In 2021 KSN for elementary students there are two subjects contested namely Mathematics and Science. At the district/city level, the number of elementary school students who took part exceeded 19,000 and then they were screened to take part at a higher level, namely the provincial level. The number of



participants who successfully passed the provincial level was 272 people. SMP/MTs students can take three subjects in the 2021 KSN including Mathematics, Natural Sciences (IPA), and Social Sciences (IPS). Participants who took KSN at the district/city level were 57,969 students and more than 240 people who were able to continue at the provincial level. High school / MA students are allowed to take more than 8 fields each of which are Mathematics, Physics, Chemistry, Biology, Informatics / Computers, Astronomy, Economics, Earth and Geography. The number of participants for the district/city and provincial levels, respectively, is 228,901 and 100 students [4].

At the National Science Competition at every district/city as well as provincial and national level, tests are given in the form of multiple choice and short entries, specifically for Geography for high school/MA students plus exploration and observation. One of the objectives of holding the National Science Competition is to provide opportunities for students to explore talents/interests in the field of science and improve achievement not only at the school, district/city, provincial, and national levels but are also expected to be able to compete in the international arena. There are several advantages that can be obtained by students who win the National Science Competition, namely getting medals and bonuses in the form of money, while high school/MA students get scholarship opportunities to universities both domestically and abroad.

In 2022 the National Science Competition changed its term again to the National Science Olympiad (OSN). The implementation of the 2022 Junior High School National Science Olympiad is specifically handled by the National Achievement Center which aims to encourage the improvement of the quality of the field of science covering three scientific fields, namely Social Sciences, Natural Sciences, and Mathematics. This activity encourages students to improve their ability to think critically, creatively and do analysis. Students are required to be able not only in theory but also to apply problem solving in everyday life. Furthermore, the National Science Olympiad activities ensure that junior high school students get a quality education so that by 2045 the generation that will be produced will be the golden generation.

The theme taken is "Science Talents for Advanced Indonesia". OSN SMP 2022 can be attended by junior high school students and/or the equivalent and Indonesian Schools Abroad (SILN) grades 7 and 8 in the 2021-2022 school year. The maximum age of participants is 16 years as of December 31, 2022. An additional requirement that must be possessed by students is that each participant must have a report card score for the field of competition that is followed for each semester to reach a minimum of seventy-five. Students who won gold, silver, and bronze medals at the National Junior High School OSN in 2021 are not allowed to take part in the following year. The entire series of events is carried out online by observing health protocols to deal with the covid pandemic. The implementation is from April to July 2022. In the field of Mathematics, a theoretical test is carried out in the form of a description with a total of 10 questions, 5 numbers are tested per day so that the total exam time is 2 days. Each number has a maximum score of 7 (seven). Participants who are entitled to gold medals are participants who are ranked one to ten. Silver medals were awarded to participants ranked eleven to twenty-fifth. Bronze medals will be awarded to participants who rank twenty-six to forty-five [5].

Ambon Catholic Junior High School is one of the schools that always participates in OSN SMP every year. Many achievements have been achieved by Ambon Catholic Junior High School students both at the district/city and provincial levels. Several times, Ambon Catholic Junior High School students managed to win the OSN Junior High School in Mathematics for the city of Ambon and then won in the Maluku province. Ambon Catholic Junior High School always strives to be able to improve student achievement, especially at the national level because so far it has not managed to get a satisfactory rank to get a medal. In 2022, the school will hold a selection to select students who represent the school to participate in the OSN SMP Mathematics at the Ambon city level. There were five candidates and one student was selected based on the highest score with the initials J. The school provides assistance to help student J take the test at the city level. The questions tested in the Olympics are non-routine questions. The material tested consisted of numbers, algebra, geometry, data and probability analysis, and capita selection.

The scope of number material consists of operations on integers, rationals, roots, and exponents and their properties, number bases, remainders of division, greatest common factor, and least common multiple. In the field of geometry, the ability to apply the concepts of lines and angles includes the position of the two lines, the distance of two points and the distance from a point to a line and then the properties of angles, the Pythagorean theorem, the Cartesian coordinate system, transformations on planes and spaces in solving problems in life. In the scope of data analysis material and opportunities, the average, median, single data mode and their interpretation are discussed, followed by the presentation of data in the form of tables,

diagrams, graphs, and their interpretations. In addition, it also discusses the rules of counting including addition, multiplication, permutation, and combinations and the probability of an event. The *Capita Selecta* material discusses solving contextual problems related to numbers, algebra, geometry, data analysis and probability. In algebra material, students are required to be able to apply the concept of a complete set of definitions, notations, and operations and then relations, functions, comparisons of value, inverse comparisons of values, linear and quadratic equations with one or two variables, linear and quadratic inequalities with one or two variables. , a two-variable linear equation system, number patterns, sequences, series, and algebraic operations in solving problems in everyday life.

The Olympiad questions given have different characteristics from math problems in learning at school. The questions tested usually require insight because the questions raised by the jaran arise when learning mathematics in class. The time allotted to solve OSN questions is very little so that students must be observant and careful in understanding the questions, besides the time to answer is too short, the completion of some questions includes many stages to arrive at a solution. So that students can solve Olympic questions quickly and accurately, it is necessary to have the habit of discussing OSN questions. In short, the experience of solving problems with various types of questions really helps students to succeed in the Olympics. Tohir [14] suggests various strategies that can be taken in order to successfully solve the Olympics questions, namely looking for patterns, making pictures, selecting notations and then writing them down, making divisions per case, doing the process of working in reverse.

One way to help students take part in the Olympics is to analyze the difficulty of solving Olympic questions as carried out by [11] . They analyzed the errors of class IX students of SMP Negeri 1 Palembang with the material used was algebra. The number of students studied were 22 people. This study uses Newman Error Analysis and data obtained by conducting tests and interviews. The results showed as many as 16% of students misunderstood, there were 40% of students who made transformation errors and the highest percentage of errors made by students occurred in the calculation process. Furthermore, Rohimah [9] argue that it is important to analyze how students think critically when solving Olympic questions on number theory material. In line with the research conducted by Mandalina, & Syaharuddin [7], materi olimpiade yang diteliti adalah teori bilangan, aljabar, kombinatorika, serta geometri. the Olympic materials studied are number theory, algebra, combinatorics, and geometry. From the activities carried out on students, there were 11 students from MTs Nurul Jannah Ampenan from grades VII, VIII, and IX. These students have difficulty solving geometry problems because there is a lot of geometry material and also have prerequisites that must be mastered in grades VII and VIII. In addition, it was revealed that students were less able to perform arithmetic operations.

Analyzing students' difficulties in solving Olympic questions for all the materials tested at the National Science Olympiad is very important so that it can describe the difficulties experienced by students and then investigate what factors make it difficult for students to work on the questions. The goal is to be able to provide appropriate assistance in the form of solutions so that students no longer have difficulties. Newman's Error Analysis procedure is one of the error analysis that is widely applied by researchers. This analysis was first carried out by Anne Newman who is a mathematics teacher in Australia in 1977 to find out how students understand and try to solve a given problem. Newman's Error Analysis procedure has five stages, namely: 1) reading errors, 2) errors in understanding the questions, 3) transformation errors, 4) errors in processing skills, 5) writing errors in the final answer. There are indicators for each type of error.

The first stage of reading errors is the indicator when students are not able to interpret the existing symbols correctly, unable to interpret words, sentences or terms in questions. There are four indicators of understanding the problem, namely not being able to write anything that is known from the question, students are able to write but it is not correct, do not write down what is asked in the question, the last is students have written whatever was asked about the question but it is not true. One of the indicators for the transformation error is that the student makes an error in choosing the operation to solve the problem,

then the student is unable to complete the problem to the end. Students make mistakes in counting is an indicator of wrong skills. The three indicators of writing errors in the final answer, respectively, are writing the units in the final answer incorrectly, not having the ability to write conclusions and writing wrong conclusions [13]. Several studies that use Newman's Error Analysis include the research conducted by Sari, Rustam, dan Maysarah [10] with the subjects being 32 students of class VIII-1 MTs Negeri 1 Deli Serdang when solving algebra problems. It was found that 16 errors in reading the questions, more than 20 errors in understanding the questions, while for errors in writing the final results and errors during processing skills



were 6 and 4. Widhiyassifah & Sumardi [15] from the analysis of students of class X MIPA-5 SMA Negeri 1 Kartasura solved the exponential problem, which concluded that there were 35 transformation errors, 50 completion errors and 62 errors in drawing conclusions. Furthermore, Annisa & Kartini [1] analyzed student errors in solving arithmetic sequences and series problems. The students studied were students of class XI SMA Negeri 1 Hulu Kuantan with a total of 23 people. The most mistakes made during the process skill error were 10 errors, followed by transformation errors with 10, comprehension errors 4, encoding errors 2 and reading errors only 1. Analysis of student errors on integer material in 30 grade VII-A students of SMP Aloysius Turi indicated that there were 30 errors each when students wrote their final answers and process skills. Students still make mistakes in doing the transformation, namely 29. The error in understanding the problem reaches 10 errors. The good news is, there are no errors when reading the questions [12]

Nurikawai, Sagita, dan Setiyani [8] conducted a study on 15 grade VIII students of SMP Negeri 1 Turi by analyzing the difficulty of understanding students' mathematical concepts in solving algebra problems. The questions tested are 5 items. In line with the five studies mentioned earlier Fitriatien, S. R. (2018) also uses Newman to analyze class VII-E students of SMP Dharma Wanita Surabaya with a total of 26 research subjects. Based on the results of the analysis of student errors in answering the story questions of Cartesian coordinates in the form of descriptions with the number of questions given being 2 questions, it was revealed that every student still made mistakes to answer each question number, even some students made up to 4 mistakes at once for question number 2. Asyhar, Sholihah, Munawaroh [3] suggest analyzing student errors using Newman but adding a review based on each student's learning style. There are three divisions of learning styles, namely visual for students who learn by seeing things, it is easier to digest lessons by watching videos, pictures or pictures. Auditory learning style for students who learn more easily by listening to lectures or verbal instructions. Kinesthetic learning style students learn more easily by practicing or by touching. Based on the explanation above, this study aims to analyze student errors in solving math olympiad questions by paying attention to student learning styles.

2. Methods

This research is a descriptive qualitative research which is included in the type of case study research. The research subjects were one student participating in the National Mathematics Olympiad at the Ambon City Junior High School in 2022, amounting to one student from Ambon Catholic Junior High School. Previous participants have passed the national science olympiad selection conducted by the school by setting aside four other participants so that they are entitled to represent schools at the district/city level. This participant has the initials J and is still in class VII. Data collection techniques used in this study were description tests, interviews, and learning style questionnaires. The test given consists of 10 questions. The questions are taken from the Olympic questions from the previous year. The research data in the form of a test description of the Olympics and interviews were first reduced to suit the needs of the next study, triangulation was carried out with the aim that the data collected was valid so that conclusions could be drawn. This study uses the analysis suggested by Anne Newman, better known as the Newman analysis. There are five errors in Newman's analysis. Each type of error has indicators for easy identification. Table 1 presents the indicators and codes of the five types of Newman errors.

Table 1
Code Types Of Errors And Newman Error Analysis Indicators

Types of Errors	Code	Indicator	Code
Error reading	M	students are not able to interpret the existing symbols correctly	M1
		Students are not able to interpret words, sentences or terms in the questions	M2
Misunderstood the question	N	Students do not write down what they know	N1
		Students write down what they know but are not true	N2
		Students do not write down what is asked	N3
		Students write down what they asked but it's not true	N4
Transformation error	O	Students are wrong in choosing the operation used to solve the problem	O1
Process skill error	P	Students incorrectly use the correct mathematical rules or rules	P1
		Students cannot further process the solution from solving the problem	P2
		Error in doing calculations	P3
Final answer writing error	Q	Student is wrong in writing the unit of the final answer	Q1
		Students can not write conclusions	Q2
		Students write conclusions but they are not correct	Q3

Questionnaire learning style adapted from Silitonga [12] consisting of 24 statements. Statements from numbers one to eight are used to screen out students with visual learning styles, statements numbered nine to sixteen are intended for students with auditory learning styles, while for kinesthetic learning styles, statements number seventeen to twenty-four are listed. There are five answer choices for the 24 statements, namely TP (Never), JR (Rarely), KD (Sometimes), SR (Often), and SL (Always).

3. Results And Discussion

To find out the students' ability in working on the national science olympiad questions, students were given a description test of 10 questions. Then the results of students' answers were analyzed by applying Newman's analysis and it was found that students made errors of forty percent of the number of questions. Students make mistakes in number questions 1, 3, 7, and 9. For more details, it is shown in Table 2 types of errors, indicators, and indicator codes.

Table 2.
Recapitulation Of Errors Made By Students

Question	Type of error Indicator	Indicator Type of Error	Indicator Code
1.	Process skill error	Students cannot further process the solution from solving the problem	P2
	Final answer writing error	Error in doing calculations	P3
2.	-	Siswa tidak dapat menuliskan kesimpulan	Q2
3.	Process skill error	-	-
	Final answer writing error	Error in doing calculations	P3
4.	-	Students write conclusions but they are not correct	Q3
	-	-	-
5.	-	-	-
	-	-	-
6.	-	-	-
	-	-	-
7.	Process skill error	Error in doing calculations	P3
	Final answer writing error	Students write conclusions but they are not correct	Q3
8.	-	-	-
9.	Misunderstood the question	Students write down what they know but are not true	N2
	Error reading	Students are not able to interpret words, sentences or terms in the questions	M2
	Transformation error	Students are wrong in choosing the operation used to solve the problem	O1
10.	Final answer writing error	Students write conclusions but they are not correct	Q3
	-	-	-

Based on Table 2, it can be seen that the students most often made five processing skills errors, followed by four times the final answer writing error and reading comprehension errors and transformation errors respectively. -one time each. An indicator of the type of error made by students more than once is doing the wrong calculation (P3) three times, and also having written a conclusion but the conclusion given is still incorrect (Q3) done four times. From the five types of errors, students did not make mistakes in understanding the questions. In the type of error in reading the questions, students were found unable to interpret the words, sentences or terms in the questions (M2). Furthermore, in the type of transformation error, students are wrong in choosing the operation used to solve the problem (O1). Figure 1 shows the results of student work when working on question number one.




<p><u>Soal nomor 1</u></p> <p><u>Diketahui segitiga ABC siku-siku di C.</u></p> <p><u>Panjang hipotenusanya 8 cm dan $a+b=\sqrt{108}$.</u></p> <p><u>Luas segitiga ABC adalah...</u></p>	<p>Jawab</p> <p>Dik : Segitiga ABC siku-siku di C Panjang hipotenusanya = 8 cm $a+b = \sqrt{108}$ Dit : Luas segitiga ABC</p> <p>Penyelesaian</p>  <p>$c^2 = a^2 + b^2$ $8^2 = (a+b)^2 - 2ab$ $64 = (\sqrt{108})^2 - 2ab$ $64 = 108 - 2ab$ $2ab = 34$ $ab = 17$</p>
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Figure 1. Questions and Student Worksheets for Question Number 1

From the results of students' work on question number one, students made mistakes in doing calculations (P3), namely $2ab = 34$, $2ab = 44$. After students got ab scores, students should continue calculate the area of a triangle. However, students did not process further (P2) but only wrote down to determine the ab value. Furthermore, students did not write down the conclusion of question number one (Q2). This is in accordance with the results of research, Setiawan, Hapizah, & Hiltrimartin [11]). Students of SMP Negeri 1 Palembang made an error in the calculation process reaching forty percent. The number of errors in the type of error when doing calculations reached 20 where 8 occurred when generalizing the remaining 12 occurred when students did not do the next work. In Figure 2 it is shown when students answer question number three on the topic of the set.

<p><u>Soal nomor 3</u></p> <p><u>Rata-rata umur m murid SMP Katolik Ambon yang telah divaksin A adalah 12 tahun. Jika ada sebanyak n murid berusia sama yaitu 15 tahun yang telah divaksin B maka rata-rata umur semua murid tersebut menjadi 13 tahun.</u></p> <p><u>Nilai $\frac{n}{m}$ adalah</u></p>	<p>Jawaban</p> <p>Dik : $\bar{X}_A = 12$, $\frac{A}{m} = 12$, $A = 12m$, $\frac{A+B}{m+n} = 13$ $\bar{X}_B = 15$, $\frac{B}{n} = 15$, $B = 15n$</p> <p>Dit : $\frac{n}{m} = \dots ?$</p> <p>Penyelesaian</p> <p>$\frac{A+B}{m+n} = 13$ $A+B = 13m + 13n$ $12m + 15n = 13m + 13n$ $2n = m$ $\frac{n}{m} = \frac{1}{2}$</p> <p>Jadi, $\frac{n}{m} = \frac{1}{2}$</p>
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Figure 2. Questions and Student Worksheets for Question Number 3

Some conclusions that can be drawn based on the image above are that students make two types of errors, in addition to miscalculate the results of $\frac{n}{m}$ correct answer should be $\frac{1}{2}$ but students write $\frac{2}{1}$. In question number three students were able to write the final conclusion but it was still not correct. Asyhar, Sholihah, & Munawaroh [3] explained that the results of their research found that students with visual learning styles made the same mistake, namely writing incorrect final conclusions. In line with the research of Nurikawai, Sagita, & Setiyani [8] of the five questions tested, it turned out that students made mistakes in writing the final answers to questions number three, four and five. Furthermore, students in the high category

still made mistakes in writing the final answer, but the students in the medium and low categories did not make any mistakes. Figure 3 is a complete question with student answers for question number seven.

<p>Soal nomor 7</p> <p>Pada suatu data terdapat 25 bilangan bulat positif. Bilangan terbesar pada data tersebut adalah 60.</p> <p>Median dari data tersebut adalah 35. Rata-rata terbesar yang mungkin dari data tersebut adalah...</p>	<p>Jawaban</p> <p>Dik : $n = 25$ $\bar{x}_B = 35$ $x_{25} = 60$</p> <p>Dit : \bar{x} terbesar</p> <p>Penyelesaian</p> <p>$x_1, x_2, \dots, x_{13}, \dots, x_{25}$ $35, 35, \dots, 35, 60, \dots, 60$</p> $\bar{x}_{\text{terbesar}} = \frac{x_1 + x_2 + \dots + x_{25}}{25}$ $= \frac{13 \cdot 35 + 12 \cdot 60}{25}$ <p style="text-align: center;"><u>45</u></p> <p>Jadi, rata-rata terbesar adalah 45</p>
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Figure 3. Questions and Student Worksheets for Question Number 7

Question number seven regarding the median, students made two types of errors, the same as in number three. Students perform calculations from $\frac{13 \times 35 + 12 \times 60}{25}$ with a result of 45 but the correct answer is 47. From the student's work paper, it can be seen that the student wrote the final answer incorrectly due to an error in doing the calculation in the previous step. The results of this study are not in line with research from Setiawan, Hapzah, dan Hiltrimartin [11] which found that none of the 22 students made mistakes in writing conclusions. this is due to the definition of error in making conclusions used by Setiawan et al. Where students are not able to make conclusions when they have read, understood the questions, transformed and performed process skills appropriately. While in this study, the majority of students made mistakes due to miscalculations. Question number nine is the last question that students make four types of errors, namely N2, O1, Q3, and M2. For more details shown in Figure 4. s

<p>Soal nomor 9</p> <p>Misalkan terdapat nilai ulangan mempunyai rata-rata 71.</p> <p>Jika ada tambahan sebanyak m nilai ulangan yang masing-masing 90, maka rata-ratanya sekarang menjadi lebih dari 85. Nilai adalah $\frac{m}{n}$...</p>	<p>Jawaban</p> <p>Dik : $\bar{x}_n = 71$ $\bar{x}_m = 90$ $\bar{x}_{m+n} = 85$</p> <p>Dit : $\frac{m}{n} = \dots ?$</p> <p>Penyelesaian</p> $\frac{x_1 + x_2 + \dots + x_n}{n} = 71$ $x_1 + x_2 + \dots + x_n = 71n$ $\frac{x_1 + x_2 + \dots + x_n + 90m}{n+m} = 85$ $71n + 90m = 85(n+m)$ $71n + 90m = 85n + 85m$ $90m - 85m = 85n - 71n$ $5m = 14n$ $\frac{m}{n} = \frac{14}{5}$ <p>Jadi, $\frac{m}{n} = \frac{14}{5}$</p>
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Figure 4. Questions and Student Worksheets for Question Number 9

The picture above is the result of student work when answering statistical questions related to average scores, students are asked to determine the value of m/n . The first mistake made was misreading the question "the average is now more than 85". Students are not able to interpret the word "more than" in the problem,

the indicator code for the type of error is M2. Students are able to write down what they know, it's just that there is something wrong (N2), namely students writing $\tilde{x}_{m+n} = 85$ should $\tilde{x}_{m+n} > 85$. Furthermore, it was found that students made an indicator error O1 error. Students are wrong in choosing the operation used to solve the problem should use "> or more than" sign but student use "=" sign. In the third step of problem solving, students write $\frac{x_1+x_2+x_3+\dots+x_n+90m}{n+m} = 80$ should be $\frac{x_1+x_2+x_3+\dots+x_n+90m}{n+m} > 85$. Students have written the final conclusion "m/n = 14/5" but it is not correct. The correct conclusion is that m/n is more than m/n is more than 14/5. This result is in line with the research of Widhiyassifah & Sumardi (2018) which found that of 34 students in class X, there were still many students who made transformation errors, reaching 34,01%. Even the error in drawing conclusions was 42.18%, namely 62 errors with errors in writing answers, namely 47 and not writing conclusions as many as 15.

To find out the learning style of student J, a learning style questionnaire consisting of 24 statements with five answer choices was given. TP (Never) = 1, JR (Rarely) = 2, KD (Sometimes) = 3, SR (Often) = 4, and SL (Always) = 5. Statements 1-8 to capture visual learning styles, students choose TP (Never) once, JR (Rarely) and KD (Sometimes) each 2, and SL (Always) 3 times. The total score obtained reached 26. Statements 9 to 16 for students with auditory learning style, the total score obtained was 18 and for statements 17 to 24 the identification of kinesthetic learning styles was 23. The results of the questionnaire of student J's learning style concluded that student J had a visual learning style.

4. Conclusions

The results of the analysis of student work on the olympiad questions are 10 questions. Students make mistakes working on four number questions, namely 1, 3, 7, and 9. For the other six numbers students answer correctly. Of the five types of errors based on Newman's analysis, namely reading errors (M), errors in understanding questions (N), transformation errors (O), errors in processing skills (P), and writing errors in the final answer (Q), it was found that students made five types of errors. the student made an error with the indicator unable to process further solutions from problem solving (P2) in question number 1. Errors in calculating (P3) three times, namely in question numbers 3, 7, and 9. Errors could not write conclusions (Q2) in question 1. Errors in writing conclusions but still not correct (Q3) in questions number 3, 7, and 9, namely three times. Students are able to write down what is known but not true (N2) found in question number 9. Furthermore, students are unable to interpret words, sentences or terms in question (M2) when working on question number nine. In this study, it was found that students did not make M1, N1, N3, and N4 errors, namely they were not able to interpret the symbols correctly, did not write down what they knew, did not write down what was asked, and wrote down what was asked but did not. Correct. Based on the results of the questionnaire, students' learning styles have a visual learning style. From the conclusions that have been presented, there are several things that can be suggested, namely the teacher needs to provide many variations of Olympic questions, especially set and statistics material so that students are familiar with non-routine questions. It is hoped that teachers will provide assistance to students by adjusting students' learning styles with a visual learning style. Furthermore, researchers can conduct research on analyzing student errors in solving Olympic questions at different levels, namely in high school (SMA) and elementary school (SD) students alike.

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