EMTEKA: Jurnal Pendidikan Matematika
Volume 6, No. 1, 2025. 191-203
DOI: https://doi.org/10.24127/emteka.v6i1.5904

e-ISSN 2746-5594
p-ISSN 2746-5608

ANALYSIS OF ANALYSIS OF STUDENT ERRORS THROUGH NEWMAN'S PROCEDURE BASED ON JUNG'S PERSONALITY TYPE IN SOLVING MATH STORY PROBLEMS

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Received January 28, 2025; Received in revised form February, 17, 2025; Accepted March 14, 2025

ABSTRACT
The purpose of this study was to analyze and describe the types of errors of students with Jung personality type in solving mathematics story problems based on Newman's procedure conducted at SMP N 9 Jambi City class VIII in the 2023/2024 school year. This study uses a type of qualitative research with a descriptive approach, this research data is in the form of MBTI personality test questionnaire results, student error test results based on Newman procedures, and interviews with research subjects. Then the data analysis techniques used are data reduction, data presentation, and conclusion drawing. The results revealed that students with Jung's personality type all experienced errors on each number with introverted students making process skill errors and writing the final answer (Encoding Error), while extroverted students made transformation errors, process skill errors, and writing the final answer (Encoding Error). From the results of the research conducted, it is concluded that students' personality types have different errors with different causal factors.
Keywords: error; jung personality; newman procedure; story problem

ABSTRAK
Tujuan Penelitian ini adalah untuk menganalisis dan mendeskripsikan tipe kesalahan siswa dengan tipe kepribadian jung dalam menyelesaikan soal cerita matematika berdasarkan prosedur Newman yang dilakukan di SMP N 9 Kota Jambi kelas VIII pada tahun ajaran 2023/2024. Penelitian ini menggunakan jenis penelitian kualitatif dengan pendekatan deskriptif, data penelitian ini berbentuk hasil angket tes kepribadian MBTI, hasil tes tertuls kesalahan siswa berdasarkan prosedur Newma, dan wawancara terhadap subjek penelitian. Kemudian teknik analisis data yang digunakan ialah reduksi data, penyajian data, dan penarikan kesimpulan. Hasil penelitian mengungkapkan bahwa siswa dengan tipe kepribadian Jung hampir semuanya mengalami kesalahan pada setiap nomornya dengan siswa introvert melakukan kesalahan keterampilan proses (process Skill Error) dan kesalahan menuliskan jawaban akhir (encoding error), sedangkan pada siswa ekstrovert melakukan kesalahan transformasi (transformation error), kesalahan keterampilan proses (process skill error), dan kesalahan menuliskan jawaban akhir (encoding error). Dari hasil penelitian yang dilakukan, disimpulkan bahwa tipe kepribadian siswa memiliki kesalahan yang berbeda dengan faktor penyebabnya yang berbeda pula.
Kata kunci*: kesalahan; kepribadian Jung; prosedur Newman; soal cerita*

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e-ISSN 2746-5594
p-ISSN 2746-5608

Introduction

According to Davita & Pujiastuti (2020) problem solving is an important need to have because in the learning process students can gain experience by using the knowledge and skills they have to apply to the problem solving process in everyday life. According to Halim dan Rasidah, (2019) math story problems are problems presented in the form of problems in everyday life where these problems are in the form of descriptions or stories, usually story problems also contain problems whose solution process requires numeracy skills. To be able to solve math problems, students are required to be able to master the application of various concepts and use computational skills in situations and conditions that are not always the same (Rahayu, Wibowo and Kurniawan, 2023). It is not only numeracy skills that are the main factor in obtaining the correct answer to a math story problem, but also the students' reasoning ability.

A teacher must be able to understand the mistakes made by students in the learning process, but also try to find a solution in order to solve these problems. Wahyudi, (2019) revealed that in learning activities, a teacher must be able to analyze and understand the mistakes made by students, provide explanations for the mistakes they experience, and find what causes these mistakes to occur. Teachers should be able to determine means of improvement and adjustment methods to help students deepen their understanding of mathematical concepts, expand their reasoning methods and sharpen their skills (Zebua, Rahmi and Yusri, 2020).

The error analysis method was first developed by Anne Newman in 1977. According to Newman, there are five stages of problem solving that can be used to analyze the types of errors made by students when solving mathematical story problems, namely: (1) Reading the problem, this error can occur because students are not careful in reading the problem so that they are wrong in getting information so that the resulting answer does not match the purpose of the problem, (2) Understanding the problem, this error can occur because students do not understand the concept so they cannot understand the problem in the problem, (3) Transformation, this error can be caused by students who have not been able to convert the problem into mathematical form correctly, (4) The solution process, this stage of error occurs because students are not yet skilled in performing calculation operations, (5) Writing answers, this error can be caused by students not being able to find answers that match the solution results required in the problem (Rohmah, Widadah & Agustina, 2021). In Newman's theory, there is an analysis of errors in reading questions and errors in understanding questions. These two stages of error have an important role in determining the level of errors made by students more accurately (Citra, Rahmwati & Vahlia, 2022). Analysis of student errors can be known through Newman's theory (Setiani, et.al., 2020).

According to Putri & Nur (2022) in their research "Analysis of Student Errors with the Newman Method in the Material of the Three-Variable Linear Equation System" in their research showed that the errors experienced by five research subjects, namely student errors in reading, understanding, and transformation, students did not answer the questions given. Student errors in process skills, namely students make mistakes in the calculation process, students do not continue the steps in solving problems, and students do not know the steps

e-ISSN 2746-5594
p-ISSN 2746-5608

to be used next in solving problems (Ngadino, Sukoriyanto & Sudirman, 2022). Finally, the error in writing the final answer is that students do not show the final answer as asked in the problem. In their research, Permatasari *et al.*, (2023) stated that the factors that influence students' errors in solving story problems can be grouped into two parts, namely internal factors that come from within themselves and external factors that come from outside the student. Arifin (2021) also argue that several factors can affect student learning success including the school environment, family, physical condition of the student, personality, and many other factors.

Personality according to Jung, (2017) contains all thoughts, feelings, character, consciousness and unconsciousness that will lead a person to adapt to the social environment and physical environment. In line with this, Alayyubi, Kasmawati & Jusriana, (2020) also argue that personality is a collection of human traits, thoughts, feelings, and behaviors that are formed over time and the individual's experience. One of the personality types found in humans was discovered by Swiss psychologist Carl Gustav Jung, where he divided human personality into two large groups, namely introverted personality types and extroverted personalities (Rofi'ah, Ansori and Mawaddah, 2019). According to Jung (Suwarno, Sholehah & Lestari, 2023), a person with an introverted personality type tends to be self-oriented, dislikes crowds, keeps a distance from others, tends to be more shy, a little pessimistic, and takes time in the process of adjusting to a new environment. Meanwhile, an extrovert is oriented towards the outside world, likes to interact with the people around him, is friendly, and is active in socializing (Fadilah *et al.*, 2023).

Based on the results of observations made by researchers at SMP Negeri 9 Jambi City and the results of interviews with one of the mathematics teachers, it shows that there are still students who have not been able to solve math story problems correctly, where students tend not to understand how the process in working on these problems so that many errors are found. This is reinforced by the results of students' answers in working on mathematical story problems on inverse value comparison material that have been given by researchers, where these answers show that there are students who are able to understand the meaning of the problems that have been given and can transform them properly, but these students are mistaken in carrying out their calculation operations, causing errors in obtaining results and drawing conclusions. According to Wahyudi, (2019) the task of a teacher is not only to correct student answers and then give them grades, but also to understand and examine the location of student errors. Therefore, student errors in working on mathematical story problems need to be analyzed, so that it will be known more deeply about the mistakes students make in answering questions. The purpose of this study is to analyze and describe the types of errors of students with Jung personality type in solving mathematics story problems based on Newman's procedure conducted at SMP N 9 Jambi City Class VIII.

Research Methods

This research was conducted in the even semester of the 2023/2024 school year at SMP Negeri 9 Jambi City kelas VIII. This research is included in the type of descriptive qualitative research. According to Bahrudin & Isnani (2022),

e-ISSN 2746-5594
p-ISSN 2746-5608

qualitative research is research that aims to understand certain phenomena. In this study, what will be described are the types of student errors based on Newman's procedure in terms of Jung's personality type in solving math story problems. This description will be traced directly through the results of the math story problem test, personality test questionnaire, and interview results. The test conducted in this study aims to obtain data on student errors in terms of Jung's personality type in solving math story problems on the material of inverse comparison based on the Newman stages.

The technique of taking research subjects used is purposive technique because the subject cannot be chosen randomly. The subjects to be selected in this study are 8th grade students of SMP Negeri 9 Jambi City who have introverted and extroverted personality types. Subject selection is based on the results of the personality test. After knowing the personality type of each student, then students with the most dominant personality type in each personality type will be selected as research subjects. The selected subjects in this study were obtained through calculating the number of personality test results given. If the student's test results are dominated by statement A, then the student has an extroverted personality type and if the student's test results are dominated by statement B, then the student has an introverted personality type.

Subjects will first be given the MBTI personality test to identify students with introverted and extroverted personalities. Then students who are identified with introverted and extroverted personalities will be given a student error test in the form of a math story problem of inverse value comparison material. During the student error test process, the researcher will make observations of the subject, then students will be interviewed using a validated interview guide to find out more about the location of errors made by students in working on student error tests in the form of mathematical story problems in the form of inverse value comparison material.

The target subjects of this study are 3 students with introverted personality types and 3 students with extroverted personality types. The personality test that will be used in this study is an MBTI questionnaire adapted from Alice Muir's book Overcoming Loneliness. The personality test sheet contains eleven A statements that indicate the extroverted personality type and eleven B statements that indicate the introverted personality type. The math problem sheet distributed to students consisted of 2 problems regarding the inverse value comparison material. Then, interviews were conducted with the research subjects. The data analysis in this study uses analysis according to Miles and Huberman which will be divided into three streams of activities including data reduction, data presentation, and conclusion drawing.

Result and Discussion

This research was conducted at SMP Negeri 9 Jambi City which was carried out on March 1-30, 2024. This study aims to analyze the errors of students with Jung's personality based on Newman's procedure in solving mathematical story problems of inverse value comparison material at SMP Negeri 9 Jambi City. To analyze errors based on Newman's procedure in students with Jung's personality type in solving story problems of inverse value comparison material, it is necessary to first conduct a personality test to determine the personality of students

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p-ISSN 2746-5608

according to Jung, namely introverted personality and extroverted personality. The test was conducted on class VIII students of SMP Negeri 9 Jambi City which was attended by 60 students on March 7, 2024. Based on the results of students' answers to the personality test and discussions with the math teacher, the researcher chose 3 students with introverted personalities and 3 students with extroverted personalities to become subjects. Subjects based on their personality will be symbolized as follows:

SI-1 = first introvert subject, SI-2 = the second introverted subject, SI-3 = third introverted subject, SE-1 = first extrovert subject, SE-2 = second extrovert subject, SE-3 = third extrovert subject. The research subjects can be seen in Table 1.

Tabel 1. Research subjects

No	Subject Name	Subject Code	Personality Type
1	P2	SI-1	*Introvert*
2	P11	SI-2	*Introvert*
3	L17	SI-3	*Introvert*
4	L7	SE-1	*Ekstrovert*
5	P8	SE-2	*Ekstrovert*
6	L20	SE-3	*Ekstrovert*

After obtaining 6 research subjects, then the subject will be given an error test question sheet consisting of 2 questions. The error test given has been validated by mathematics or mathematics education experts at Jambi University and has been declared valid.

SI-1

In solving problems both in number one and number 2, it was found that SI-1 was able to read the problem in the problem properly and correctly without making mistakes in pronunciation. Furthermore, related to understanding the problem in problem number 1, the subject has been able to write down the information known from the problem completely. However, there was a slight mistake when writing what was asked in the problem. In problem number 2 in understanding the problem in the problem, the subject has been able to write the information known from the problem completely.

Researcher : "Try to mention the information that you can know from question number 2"
SI-1 : "So the information that we know is a_1 = 4 people, a_2 = 16 people, and b_1 = 32 minutes"
Researcher : "Then why on the answer sheet did you write a_2 = 32 minutes and b_1 = 16 people?"
SI-I : "Yes, almost our mistake, we wrote it backwards. But we have put an arrow there to indicate that what we wrote was reversed."

In the transformation indicator, the subject seems to have identified the mathematical operation correctly. This is indicated by the formula written by SI-1 is correct. Then SI-1's process skills in solving the problem seemed to have known the right procedure in solving the problem, but at the end of solving the problem it

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p-ISSN 2746-5608

was found that the subject did not complete the division operation. Finally, on SI-1's answer sheet, both in question number 1 and number 2 there is no conclusion. This is because the subject did not succeed in completing his answer, so SI-1 could not make a conclusion from his answer.

SI-2

In solving problems both in number 1 and number 2, it was found that SI-2 was able to read the problem in the problem properly and correctly without making mistakes in pronunciation. Furthermore, related to understanding the problem in problem numbers 1 and 2, the subject has been able to write the information known from the problem completely. but SI-2 did not write what was asked in the problem. Furthermore, for the transformation indicator, in problems number 1 and 2, the subject seems to have identified the mathematical operation correctly. This is indicated by the formula written by SI-2 is correct.

Then SI-2's process skills in solving the problem appear to have known the right procedure in solving the problem, but SI-2 was mistaken in obtaining the division result of 240: 15 where the result that should be obtained is 16 not 24. Then in the answer writing indicator, the subject appears to have been able to write conclusions based on the results he has obtained. The following is a fragment of the researcher's interview with SI-2:

Researcher : "What is the conclusion of the answer you have obtained for question number 1?"
SI-2 : "Right b_2 = 24, so the number of workers to be added is 24 + 12 = 36 workers"
Researcher : "Are you sure about that answer? Check your answer again."
SI-2 : "Sure. Our conclusion is that the time needed is 9 minutes."

SI-3

In solving the problems both in number 1 and number 2, it was found that SI-3 had also been able to read the problem in the problem properly and correctly without making mistakes in pronunciation. Furthermore, related to understanding the problem in the problem, SI-3 did not write the known and questionable information on both answer sheet number 1 and number 2. However, through the interview stage, SI-3 was able to confirm this and managed to mention the information known from the problem completely and correctly. In the transformation indicator, the subject seems to have identified the mathematical operation correctly. This is indicated by the formula written in problem numbers 1 and 2 by SI-3 is correct.

Then SI-3's process skills in solving problem number 1 seemed not to know the right procedure in solving the problem, this can be seen when SI-3 was wrong in multiplying between the two segments. In problem number 2, SI-3's process skills were also seen not knowing the right procedure in solving the problem, this was seen when SI-3 was wrong in multiplying between the two segments. In problem numbers 1 and 2, the subject seems to have been able to write conclusions based on the results he has obtained. However, in the conclusion of problem number 2, SI-3 did not include the unit of time in his conclusion. However,

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the subject was able to confirm this through an interview, the following is a fragment of the results of the researcher's interview with SI-3:

Researcher : "What is the conclusion of the answer you have obtained for question number 1?"
SI-3 : "The conclusion is that the number of workers to be added is 9 workers"
Researcher : "Okay, then what is the conclusion of the answer you have obtained for problem number 2?"
SI-3 : "The conclusion is the amount of time needed is 128"

SE-1

In solving problems both in number 1 and number 2, it was found that SE-1 was able to read the problem in the problem properly and correctly without making mistakes in pronunciation. Furthermore, related to understanding the problem in problem number 1, the subject has been able to write down the information known from the problem and what is asked in the problem completely. In problem number 2 in understanding the problem in the problem, the subject did not write down the information known from the problem and what was asked in the problem. However, through the interview stage SE-1 realized this and managed to mention what was known and asked in the problem correctly. In the transformation indicator, the subject seemed unable to identify mathematical operations correctly. This is indicated by the formula written in problem numbers 1 and 2 by SI-3 is not correct.

Then SE-1's process skills in solving the problem appear to have known the right procedure and carried it out correctly, but the results obtained by SE-1 are still wrong because the formula used is not correct. In problem number 2, SE-1's process skills were seen to have known the right procedure and carried it out correctly, but the results obtained by SE-1 were still wrong because the formula used was not correct. In writing the answer, the subject seems to have been able to write a conclusion based on the results he has obtained. However, SE-1 was wrong in determining the number of workers to be added, while in question number 2, the subject has been able to write conclusions based on the results he has obtained. The following is a fragment of the results of the researcher's interview with SE-1:

Researcher : "What is the conclusion of the answer you have obtained for question number 1?"
SE-1 : "Previously we got $b_2 = 9$, so the workers that must be added are 9 + 12 = 21 workers"
Researcher : "Okay, then what is the conclusion of the answer you have obtained for problem number 2?"
SE-1 : "The conclusion of question number 2, so the amount of time needed to set up the tent is 128"

SE-2

In solving problems both in number 1 and number 2, it was found that SE-2 was able to read the problem in the problem properly and correctly without

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making mistakes in pronunciation. Furthermore, related to understanding the problem in problem number 1, the subject has been able to write down the information known from the problem and what is asked in the problem completely. The following is a fragment of the results of the researcher's interview:

Researcher : "Try to mention the information that you can know from question number 1"
SE-2 : "It is known that a_1 = 20 days, a_2 = 15 days, then b_1 = 12 workers, isn't it right?"
Researcher : "Yes, then what is asked in the question?"
SE-2 : "The question is how many workers should be added to meet the demand."

For the transformation indicator, the subject seems unable to identify mathematical operations correctly. This is indicated by the formula written down by SE-2 is not correct, where the subject uses the formula for value comparison to solve the two problems. Then SE-2's process skills in solving problems number 1 and 2 were seen to have known the right procedure and carried it out correctly, but the results obtained by SE-2 were still wrong because the formula used was not correct. Then to write the answer, the subject seems to have been able to write a conclusion based on the results he has obtained.

SE-3

In solving problems both in number one and number 2, it was found that SE-3 was able to read the problem in the problem properly and correctly without making mistakes in pronunciation. This can be proven by the results of the interview with the subject. Furthermore, related to understanding the problem in problem number 1, the subject has been able to write down the information known from the problem and what is asked in the problem completely. In problem number 2 in understanding the problem in the problem, the subject has been able to write down the information known from the problem and what is asked in the problem completely. For the transformation indicator, the subject seems unable to identify mathematical operations correctly. This is marked by the formula written by SE-2, which is incorrect, where the subject uses a proportional formula to solve both problems.

Then, the process skills of SE-3 in solving questions 1 and 2 show that they know the correct procedure and carry it out properly, but the result obtained by SE-3 is still incorrect because the formula used is not accurate. In SE-3's answer sheet, both in question 1 and question 2, there is no conclusion. Through the interview stage, it is evident that the subject does not have a conclusion for the answers they provided. Below is an excerpt from the interview between the researcher and SE-3.

Researcher : "What is the conclusion of the answer you obtained for question number 1?"
SE-3 : "Mmm... The conclusion is the one we marked with a line, ma'am."
Researcher : "Okay, next, what is the conclusion of the answer you obtained for question number 2?"

e-ISSN 2746-5594
p-ISSN 2746-5608

SE-3 : "It's the same, ma'am, we also marked it with a line on the answer sheet."

According to Singh et al., (2010) Reading errors are mistakes that occur when students are unable to read the problem or recognize the symbols in the problem. Errors in reading the problem are typically referred to as Type R errors (Lestari and Afriansyah, 2022). Mistakes at this stage can only be identified through the interview stage. Based on the description of the subjects' answers to both problems, it is known that SI-1, SI-2, SI-3, SE-1, SE-2, and SE-3 did not make any errors during the reading stage. This is evidenced by the interview results with the six research subjects, where the interview results indicate that all subjects were able to read the problems correctly and accurately.

Comprehension errors are mistakes that occur when students are unable to understand or are unaware of the information contained in the problem, and do not know what is being asked in the question. Errors in comprehending the problem are typically referred to as Type C errors (Adhim & Amin, 2019). Based on the description of the subjects' answers to both problems, it is known that SI-1, SI-2, SI-3, SE-1, SE-2, and SE-3 did not make any errors during the comprehension stage. This is evidenced by the interview results with the six research subjects, where the interview results indicate that all subjects were able to fully understand the information contained in the problems and knew what was being asked.

Transformation errors are mistakes that occur when students are unable to correctly identify the appropriate mathematical operation to solve a problem. Errors in transformation are typically referred to as Type T errors (Pratami, Sundayana & Sofyan, 2023). Based on the description of the subjects' answers to both problems, it was found that SE-1, SE-2, and SE-3 wrote incorrect formulas. The mistake made by SE-1, SE-2, and SE-3 during the transformation stage was in determining the formula to be used to solve the problem. According to the researcher's analysis based on the Newman procedure, SE-1, SE-2, and SE-3 are considered to have made Transformation Errors. This is because the three subjects met the error indicators of the transformation stage, which is their inability to identify the correct mathematical operation. This aligns with the research conducted by Rejeki & Sari, (2021), where the findings indicate that Transformation Errors occur because students are unable to present a mathematical model to solve the problem.

Process skills errors are mistakes that occur when students perform the procedure incorrectly or do not know the correct procedure to carry out operations to solve a problem. Errors in process skills are typically referred to as Type P errors (Laily, 2014). Based on the description of the subjects' answers to both problems, it was found that SI-1, SI-2, SI-3, SE-1, SE-2, and SE-3 obtained incorrect results. The mistake made by SI-1 during the process skills stage was their inability to continue solving the problem. The mistake made by SI-2 during the process skills stage was an error in the process of solving the problem. The mistake made by SI-3 during the process skills stage was an error in performing the procedure to solve the problem. This is in line with the research conducted by Putri & Nur (2022) where the findings indicate that one of the causes of errors

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p-ISSN 2746-5608

during the process skills stage is because students do not know the correct procedure for solving the problem.

The mistake made by SE-1, SE-2, and SE-3 during the process skills stage was obtaining incorrect results. In this case, the errors made by the subjects were a result of mistakes made during the transformation stage. The use of incorrect formulas led to the subjects obtaining incorrect results, which in turn caused the final results to be incorrect as well. The research conducted by Rosidah et al., (2022) also indicates that students with an extroverted personality tend to make errors in process skills when solving word problems in mathematics. The errors made by SE-1, SE-2, and SE-3 were caused by mistakes at the transformation stage. This aligns with the research by Hidayat et al., (2022) which states that one of the causes of errors during the process skills stage is the result of previous errors.

According to the researcher's analysis based on the Newman procedure, SI-1, SI-2, and SI-3 are considered to have made Process Skills Errors because they meet the error indicators of the process skills stage, which include mistakes in carrying out the procedure or not knowing the correct procedure to perform the operations needed to solve the problem. This aligns with the research conducted by Putri & Nur (2022), which states that the causes of Process Skills Errors include mistakes in the calculation process, failure to continue the solution procedure, and lack of knowledge about the correct procedure for solving the problem. Meanwhile, SE-1, SE-2, and SE-3 are considered to have made Process Skills Errors due to mistakes made in the previous stage.

Process skills errors are mistakes that occur when students are unable to or make errors in drawing conclusions. Errors in writing the answer are typically referred to as Type E errors (Wulandari and Ekawati, 2023). Based on the description of the subjects' answers to both problems, it was found that SI-1, SI-2, SI-3, SE-1, SE-2, and SE-3 wrote incorrect conclusions. The mistake made by SI-1 during the answer-writing stage was failing to write a conclusion. The mistake made by SI-2 and SI-3 during the answer-writing stage was writing an incorrect conclusion. Then, the mistake made by SE-1 during the answer-writing stage was drawing an incorrect conclusion. The mistake made by SE-2 during the answer-writing stage was writing an incorrect conclusion. Finally, the mistake made by SE-3 during the answer-writing stage was failing to write a conclusion.

According to the researcher's analysis based on the Newman procedure, the five subjects, namely SI-1, SE-1, and SE-3, are considered to have made Answer-Writing Errors because they meet the error indicators of the answer-writing stage, which include being unable to or making errors in drawing conclusions. This aligns with the research conducted by Sari & Rejeki (2021), where the findings state that factors causing errors in writing answers include students making mistakes in writing the final answer, the final answer not matching what was asked in the problem, and the answer being incomplete. Meanwhile, SI-2, SI-3, and SE-2 are considered to have made Answer-Writing Errors due to mistakes made in the previous stage.

When reviewing the subjects' personalities during the error test, introverted subjects tended to be more meticulous, which caused them to be relatively slow in solving the problems. Additionally, when determining which formula to use, introverted subjects appeared to take a bit longer to think before

e-ISSN 2746-5594
p-ISSN 2746-5608

deciding on a formula and drawing a conclusion. This aligns with what Jung (2017) stated about the characteristics of introverts, where he mentioned that individuals with this personality type tend to be very careful when making decisions.

On the other hand, extroverted subjects appeared to be more enthusiastic. During the error test, extroverted subjects were found to ask various questions to the researcher. Furthermore, when solving the problems, the subjects seemed optimistic about the answers they obtained. This aligns with what Jung (2017) said about the characteristics of extroverts, where he mentioned that individuals with this personality type have good interaction skills, are full of energy, and are optimistic.

Based on the results of the error test and interviews with the subjects when solving reciprocal comparison problems, the researcher's analysis based on the Newman procedure found that none of the subjects made Reading or Comprehension Errors. Introverted subjects were found to mostly make Process Skills Errors and Answer-Writing Errors. Meanwhile, the three extroverted subjects were found to mostly make Transformation Errors, Process Skills Errors, and Answer-Writing Errors.

Theoretically, this study describes students' errors based on the Newman procedure, viewed from Jung's personality types. This study also illustrates students' errors in solving word problems in mathematics related to inverse proportionality. Additionally, students gained new insights into their own personalities, which can help them better understand themselves in the learning process. Therefore, this study has implications as a consideration for teachers when designing lessons that are tailored to students, and it can also serve as a reference and source of information for conducting broader research.

Conclusion and Suggestion

Based on the results of the research, it was found that introverted students, when solving word problems in mathematics related to inverse proportionality, made Process Skill Errors and Encoding Errors. On the other hand, extroverted students made Transformation Errors, Process Skill Errors, and Encoding Errors.

For future research, this study can serve as a consideration for designing lessons that are tailored to students' personalities, thus minimizing students' errors when solving word problems in mathematics.

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