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An Analysis of Students' Pseudo-Thinking Processes in Solving Algebra Problems from The Perspective of Self-Confidence

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ABSTRACT

This study aims to describe the pseudo-thinking processes of eighth-grade junior high school students in solving algebra problems, as viewed from the perspectives of high, moderate, and low levels of self-confidence. This study was conducted in the eighth grade at SMP Negeri 7 Palu during the 2025/2026 school year. A total of 3 students were selected from a group of 29 students. This research method uses a qualitative approach of a descriptive nature.The researcher employed a self-confidence questionnaire, an algebraic problem-solving test, and interviews. The results indicate that students have high self-confidence in their ability to solve problems correctly and follow problem-solving steps; however, they still struggle to explain their reasoning conceptually, suggesting that their thinking is pseudo-correct. Students with moderate self-confidence are able to solve problems fairly well, but they still make mistakes in their approach and conceptual understanding, so they tend to engage in pseudo-correct thinking, although not to the same extent as students with high self-confidence. Students with low self-confidence tend to have difficulty understanding and solving problems, leading them to give incorrect answers; however, they are able to correct their mistakes after reflecting on them, thus demonstrating pseudo-errors.

Keywords: pseudo-thinking; algebraic problem-solving; self-confidence

INTRODUCTION

Education plays a vital role in developing students' thinking skills, particularly through mathematics instruction. This aligns with the view expressed by Darmawati & Purnomo (2022), who state that mathematics is one of the subjects that plays a vital role in education. Mathematics plays a crucial role in fostering a mindset that influences various aspects of life. Furthermore, mathematics is one of the fields of study that supports and influences the advancement of science and technology (Siregar, 2021). Although mathematics education aims to develop logical, critical, and systematic thinking skills, in practice students often face challenges in applying their conceptual understanding correctly. When solving mathematical problems, it is essential to link prior conceptual understanding with new concepts being introduced. During the process of constructing solutions, errors often occur unconsciously. Students may believe that the concepts they express are correct, when in fact they are not. These concepts, which are mistakenly believed to be correct, are known as pseudo-thinking, which can be interpreted as illusory thinking.

Pseudo-thinking is the process of unconsciously constructing solutions, during which errors frequently occur. The concepts believed to be correct are referred to as pseudo-thinking, or can be interpreted as illusory thinking (Salsabila & Azhar Ervin, 2022). According to Vinner (1997) pseudo-thinking is a condition in which students solve problems without being based on a complete conceptual understanding, so the reasoning process used does not correspond to the actual concept. Pseudo-thinking can be categorized into correct pseudo-thinking and incorrect pseudo-thinking. Correct pseudo-thinking occurs when a student is able to provide the correct answer but cannot explain the reasoning behind it, while incorrect pseudo-thinking occurs when a student's answer is wrong due to carelessness but can be corrected upon reflection Subanji (2006).

Errors in students' thinking processes require attention to prevent conceptual mistakes from affecting subsequent concepts. Considering that the errors experienced by students stem from pseudo-thinking, it is necessary to reorganize students' mathematical understanding in problem-solving (Efendi & Pratama, 2020).

Problem-solving is one of the essential skills that students must possess in mathematics education. Through this ability, students can enhance their conceptual understanding and competence in solving various mathematical problems independently and creatively. "According to Sriwahyuni & Maryati (2022), problem-solving ability is one of the learning processes that can encourage students to take an active role in learning. The difficulties students experience in solving mathematical problems are generally caused by a lack of conceptual understanding. Students often make mistakes when solving problems because they are more interested in memorizing rather than understanding the concepts of the material. The ability to solve problems by following the correct steps can reduce the likelihood of pseudo-thinking. However, to achieve this, supporting factors are required, one of which is students' self-confidence, so that they do not feel afraid to try solving mathematical problems Rochayati & Fa'ani (2019).

Self-confidence is one of the important affective aspects that students should possess in mathematics learning (Khoirunnisa & Rahayu, 2025). It is a personality trait that reflects an individual's belief in their own abilities, and therefore is not influenced by others Turmudzi & Hakim in (Gunawan et al., 2025). Self-confidence affects students' academic achievement, as those who have good self-confidence tend to have the desire and effort to achieve success, which ultimately leads them toward learning achievement (Prasetiawan et al., 2023). "According to Hendrawan & Hendriana (2021), several indicators of self-confidence are as follows: (1) believing in one's own abilities, (2) acting independently in making decisions, (3) having a positive self-concept, and (4) being courageous in expressing opinions. Several relevant studies have examined pseudo-thinking in mathematical problem-solving. The relevant study by Salsabila & Azhar Ervin (2022), entitled Analysis of Pseudo-Thinking Errors in Solving Mathematical Problems Viewed from Self-Confidence. Revealed

That students with high self-confidence tend to experience correct pseudo-thinking, even though they obtain the right answers. Meanwhile, the study conducted by Widari & Susana (2020), entitled Profile of Pseudo-Thinking of Senior High School Students in Solving Mathematical Problems Viewed from Mathematical Ability, found that pseudo-thinking is experienced by students with various levels of mathematical ability—high, medium, and low—with different tendencies in the forms of pseudo-thinking. In addition, the study conducted by Indri & Widiyastuti (2018), entitled Analysis of Pseudo-Thinking in Solving Mathematical Problems, showed that students at various levels of ability also experience pseudo-thinking, both correct and incorrect, during the problem-solving process. However, most of these studies focus on the general context of mathematical problem-solving or on different subject areas, and have not specifically examined the analysis of students' pseudo-thinking processes in solving algebraic problems at the junior high school level in depth, particularly among eighth-grade students at SMP Negeri 7 Palu.

Based on the results of preliminary observations conducted by the researcher at SMP Negeri 7 Palu, the mathematics teacher noted that while many students were able to answer questions correctly, the explanations or justifications they provided were inaccurate and did not align with the intended mathematical concepts. This phenomenon indicates that students have not fully grasped the underlying concepts but are merely following memorized procedures without understanding their meaning. This condition describes a process of pseudo-thinking, a state in which students appear to understand and answer correctly, but their responses are not grounded in a deep conceptual understanding.

Based on information obtained from teachers regarding the phenomenon occurring at SMP Negeri 7 Palu, it is evident that students have not yet grasped mathematical concepts optimally. This finding reinforces the importance of research to further analyze how the pseudo-thinking process experienced by eighth-grade students at SMP Negeri 7 Palu in solving algebra problems is viewed from the perspective of self-confidence, so that students can enhance their understanding of mathematical concepts in solving algebra problems. Therefore, the researcher is interested in conducting research on the analysis of students' pseudo-thinking in solving algebra problems.

This study aims to describe the pseudo-thinking processes exhibited by eighth-grade students when solving algebra problems, based on indicators of pseudo-thinking. It is hoped that this study will serve as a reference for advancing knowledge in the field of education, thereby enhancing students' understanding of mathematical concepts.

RESEARCH METHODS

This study employs a descriptive qualitative approach to describe or provide an overview of pseudo-thinking. The study was conducted at SMP Negeri 7 Palu among eighth-grade students during the 2025/2026 academic year.

Three subjects were selected from 29 students using purposive sampling, based on the results of a self-confidence questionnaire. The subjects consisted of one student each who fell into the high, moderate, and low self-confidence categories. The instruments used in this study were a questionnaire, a written test, and an interview guide. The self-confidence questionnaire used a Likert scale to measure students' self-confidence by presenting 16 statements. There were 8 positive and 8 negative statements. The test used in this study was a written test in the form of an essay-style question involving algebraic addition and subtraction problems based on the indicators used. The interviews used were semi-structured, aimed at identifying issues more openly, where the interviewees were asked for their opinions and ideas. Data collection techniques included the self-confidence questionnaire, a written test on algebra, and semi-structured interviews. Prior to the study, the instruments used were reviewed and approved by expert validators.

The data analysis technique used is based on qualitative data analysis, which consists of three stages: data condensation, data interpretation, and drawing conclusions/verification, with validity tested through member checking. Data condensation involves summarizing the data obtained from interviews and written tests on students' answer sheets. In data presentation, the data set is organized and categorized to enable the drawing of conclusions.

Conclusions are drawn by describing the pseudo-mathematical thinking processes of seventh-grade students in solving mathematical problems based on data obtained from tests and interviews.

The intervals were used to categorize students' self-confidence levels into high, moderate, and low.

Tabel 1. Self-Confidence Intervals and Categories

Interval	*Self-confidence* Categories
$x \geq 48$	High
$41 \leq x < 48$	Moderate
$x < 41$	Low

RESULTS AND DISCUSSION

The determination of research subjects was carried out by distributing a self-confidence questionnaire to 29 eighth-grade students at SMP Negeri 7 Palu. The results showed that 8 students were categorized as high, 17 as moderate, and 4 as low in self-confidence. The following are the results of the self-confidence questionnaire.

Tabel 2. Self-Confidence Test Results

Self-Confidence Categories	Number
High Self-Confidence	8
Moderate Self-Confidence	17
Low Self-Confidence	4

Based on Table 2 above, it can be explained that among the 29 eighth-grade students of SMP Negeri 7 Palu, 8 students (28%) have a high level of self-confidence, 17 students (58%) have a moderate level, and 4 students (14%) have a low level of self-confidence. From these results, it can be concluded that the average level of students' self-confidence falls within the moderate category. The following figure presents the percentage distribution of self-confidence categories among eighth-grade students at SMP Negeri 7 Palu.

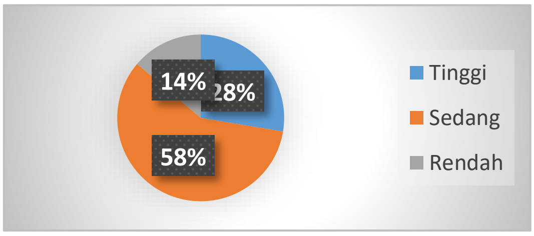


Figure 1. Percentage of Self-Confidence Categories of Eighth-Grade Students

After categorizing the students' self-confidence results, three students were selected as research subjects. From the eight students with high self-confidence, one student with the highest score (53) was chosen; from the seventeen students with moderate self-confidence, one student with a middle score (45) was selected; and from the four students with low self-confidence, one student with the lowest score (37) was chosen. The selected research subjects are presented in Table 3.

Tabel 3. Research Subjects

Subjek	Score	Self-Confidence Category
MNK	53	High
TPA	45	Medium
ADR	37	Low

After determining the research subjects, the next step was data collection through administering a written test on algebra material to each subject to identify the pseudo-thinking process. Subsequently, semi-structured interviews were conducted to obtain more in-depth information regarding students' thinking processes. The collected data were then analyzed qualitatively based on pseudo-thinking indicators to describe the characteristics of pseudo-thinking within each self-confidence category.

1) Pseudo-Thinking Process of Students with High Self-Confidence

Subject MNK in Understanding the Problem

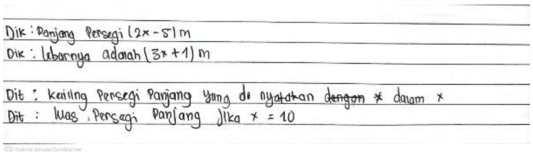


Figure 2. Problem Understanding in Subject MNK

Based on Figure 2, it can be seen that subject MNK wrote down the information given in the problem, namely the length of the square $2x - 5$ meters and the width of the rectangle $3x - 1$ meters. In addition, subject MNK also wrote down what was being asked in the problem, namely the perimeter of the rectangle expressed in x, as well as the area of the rectangle if the value of $x = 10$. During the interview stage, subject MNK also provided an explanation regarding their understanding of the problem given. The following is an excerpt from the transcript of the interview with subject MNK.

PN003	:	May I ask about the question that was given earlier?
MNK004	:	Sure, go ahead
PN005	:	Based on the question you gave earlier, do you think it's easy, moderate, or difficult?
MNK006	:	I think it's a bit difficult, sis.
PN007	:	Okay. From the problems you've already worked on, what information do you know from those problems?
MNK008	:	Given that the length of the rectangle is $2x - 5$and the width is $3x + 1$.
PN009	:	Alright. So what is the question asking?
MNK0010	:	The perimeter of the rectangle is asked for, expressed in x
PN0011	:	Is there anything else to ask, or is that all?
MNK0012	:	Yes, there is. The question also asks for the area of the rectangle when $x = 10$.

Subject MNK in Planning the Solution

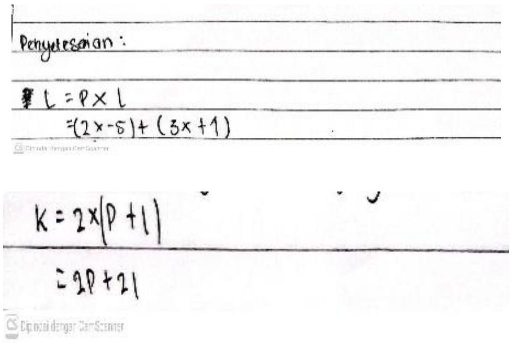


Figure 3. Planning the Solution by Subject MNK

Based on Figure 3, in the problem-solving planning stage according to Polya, subject MNK determined a solution strategy by choosing to use the formulas for the area and perimeter of a rectangle. The subject stated that the first step was to find the area using the formula *length* × *width*, followed by finding the perimeter using the formula $2(p + l)$. This demonstrates that the subject was able to organize the steps for solving the problem and select concepts relevant to the given task. The following is an excerpt from the interview transcript with subject MNK.

PN0013	:	After knowing the information from the problem, what did you do next ?
MNK0014	:	Next, I solved the problem by calculating the area of the rectangle.
PN0015	:	Did you use any formulas to solve the problem? Please explain the formulas you used
MNK0016	:	First, I calculated the area of the rectangle. The formula for the area of a rectangle is length multiplied by width. Then, I substituted the given values, where the length is $2x - 5$ m and the width is $3x + 1$ m.
PN0017	:	Besides the formula for area, did you use any other formulas? Please explain the formulas you used
MNK0018	:	I found the perimeter using the formula $2(p + l)$. After that, I substituted the values of the length and width again.

Subject MNK in Solving the Problem According to the Plan

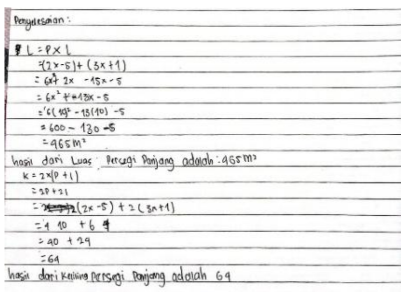


Figure 4. Solving Problems According to a Plan in the MNK Subject

Based on Figure 4, in Polya's stage of Solving Problems According to the Plan, subject MNK carried out the solution steps sequentially. MNK first calculated the area of the rectangle by multiplying the algebraic expressions $(2x - 5)(3x + 1)$. Then, MNK substituted the value $x = 10$into the obtained expression to determine the area. Afterward, MNK calculated the perimeter using the formula $2(p + l)$, substituting the known values of the length and width. These steps show that MNK attempted to follow the problem-solving procedure according to the plan that had been made. However, in performing the calculation to find the perimeter of the rectangle, there was an error in the algebraic operation process, resulting in an inaccurate outcome. From the perspective of pseudo-thinking indicators, subject MNK demonstrated the characteristics of correct pseudo-thinking, as they were able to use the formulas and solution steps consistent with the plan but made mistakes during the calculation process. The following is an excerpt from the interview transcript with subject MNK.

PN0019 : Next, how did you perform the operation?

MNK0020 : Next, I multiplied the values of the length and width first. The length of the rectangle is $(2x{-}5)$and the width is $(3x{+}1)$. I multiplied them and obtained the result $6x^2 - 13x - 5$.

PN0021 : After you obtained the result of the multiplication, what was the next step you took?

MNK0022 : After that, I obtained the result and substituted the value $x = 10$into $6x^2 - 13x - 5$. Then, I got the value of 465 m².

PN0023 : Okay. Next, how did you find the perimeter?

MNK0024 : I used the formula $2(p + l)$, then I substituted the values of the length and width, added them, and obtained the result of 64.

Subject MNK in Reviewing the Solution

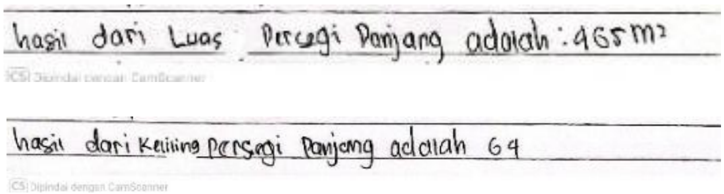


Figure 5. Reviewing Subject MNK

Based on Figure 5, regarding Polya's review stage, MNK has not fully demonstrated a thorough evaluation process of the solution. MNK only checked the final result without reviewing the calculation process that had been performed. The subject did not verify the solution steps, did not attempt to use alternative methods, and did not identify potential errors in the algebraic operations performed. The following is an excerpt from the interview transcript with subject MNK.

PN0025 : Okay. After you get the results, do you double-check the answers you've already worked on?

MNK0026 : Yes, I'll look at the results again.

PN0027 : How did you check them?
MNK0028 : I checked the final results; the area is 465 m² and the perimeter is 64.
PN0029 : Did you match your answer to the question asked?
MNK0030 : Yes, because the question asked for the area and perimeter, so I wrote that in the conclusion.
PN0031 : Are you sure the result is correct?
MNK0032 : Yes, I'm sure
PN0033 : Is there another way—a simpler or faster method—that I can use to get the same result?
MNK0034 : I don't know, sis

Based on the analysis results, subject MNK was able to understand the problem well, as demonstrated by their ability to identify known and asked information. During the planning and execution stages of the solution, the subject used the correct formula and performed algebraic operations correctly. However, the subject was less able to explain the reasoning behind the steps taken and tended to simply follow memorized procedures.

Thus, the MNK subjects fall into the category of pseudo-correct thinking. According to Subanji (2006), pseudo-correct thinking occurs when students obtain the correct answer but do not base it on a deep conceptual understanding. The indicators met are that students can provide the correct answer but cannot explain the steps conceptually, and their conceptual understanding remains superficial.

2) Students' Pseudo-Thinking Process with Moderate Self-Confidence
Subject TPA in Understanding the Problem

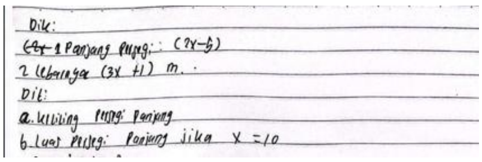


Figure 6. Problem Understanding in TPA Subjects

Based on Figure 6, it can be seen that the TPA subject wrote down the known information in the question, namely the length of the rectangle is $2x - 5$ meters and the width of the rectangle is $3x + 1$ meter. In addition, subject TPA also wrote down what was asked in the problem, namely the perimeter of the rectangle expressed in $x$and the area of the rectangle when $x = 10$. The following is an excerpt from the interview transcript with subject TPA.

PN003 : May I ask you about the problem that was given earlier?
TPA004 : Yes sis
PN005 : Based on the question you gave earlier, do you think it was easy, moderate, or difficult?
TPA006 : In my opinion, this question is moderate

PN007	:	Okay. From the questions you've already worked on, what information do you know from those questions?
TPA008	:	So, what we know is that the length of the rectangle is $(2x - 5)$ m and the width is $(3x + 1)m$
PN009	:	Okay. So what is the question?
TPA0010	:	The question is about the perimeter given by$x$, and then it also for the area of the rectangle when $x = 10$

TPA Subject in Planning the Solution

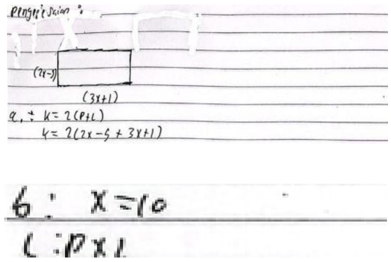


Figure 7. Planning the Solution for the TPA Subject

Based on Figure 7, in Polya's stage of *Planning the Solution*, subject TPA determined the problem-solving strategy by choosing to use the formulas for the area and perimeter of a rectangle. The subject stated that the first step was to find the perimeter using the formula $2(p + l)$, then continued by finding the area using the formula $p \times l$. This shows that the subject was able to organize the steps of the solution and select concepts relevant to the given problem.The following is an excerpt from the interview transcript with subject TPA.

PN0011	:	After reviewing the information in the question, what steps did you take next?
TPA0012	:	Hmm, first I'll draw a diagram, then I'll work out the solution.
PN0013	:	After that, how do you start working on the problem?
TPA0014	:	I started by finding the perimeter, and I used the formula K = 2 (p + l)
PN0015	:	Next, to find the area, is there a formula you use?
TPA0016	:	Yes, there is. I use the area formula $L = p \times l$.

TPA Subject in Solving Problems According to the Plan

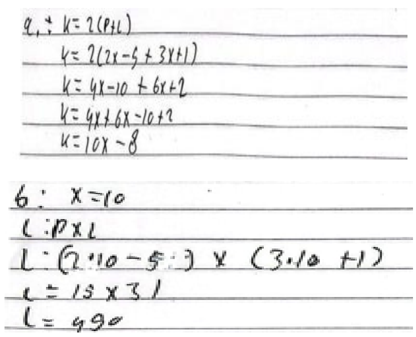


Figure 8. Solving Problems According to Plan in the TPA Subject

Based on Figure 8, in the Polya stage of Solving Problems According to the TPA Subject has been able to solve the problem according to the plan that was formulated. The TPA subject substituted the algebraic expression into the formula used, then performed algebraic operations such as addition and multiplication until obtaining the parameter $10x - 8$. In the area calculation, the subject also followed the correct steps, namely multiplying the two algebraic expressions and then simplifying the result before substituting the value $x = 10$. However, an error was found in the calculation process when determining the area value, so the final result obtained was not entirely accurate. Based on this, it can be concluded that in the stage of solving problems according to the plan, subject TPA tended to show characteristics of correct pseudo-thinking, meaning that the subject was able to follow the correct steps according to the plan but still made procedural or computational mistakes. The following is an excerpt from the interview transcript with subject TPA

PN0017 : Okay, good. After you planned the solution, how did you start applying it?

TPA0018 : I directly substituted the values of the length and width into the formula I had chosen, sir. For the perimeter, I used the formula $K = 2\ (p + l)$, so I wrote $K = 2(2x - 5) + (3x + 1)$.

PN0019 : What did you do after that?

TPA0020 : After that, sis, I added the terms inside the parentheses first, so $2x - 5 + 3x + 1 = 5x - 4$. Then, I multiplied it by 2, so $K = 2(5x - 4) = 10x - 8$.

PN0021 : Okay. Next, how did you find the area?

TPA0022 : For the area, I used the formula $L = p \times l$, so I wrote $(2x - 5)(3x + 1)$. After that, sir, I directly substituted the value $x = 10$into the length and width, and I obtained the result of 450.

TPA Subject in Reviewing the Solution

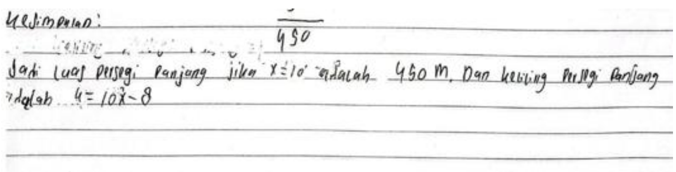


Figure 9. Rechecking by the TPA subject

Based on Figure 9, during the rechecking stage, the TPA subject has rechecked the answers obtained. This is indicated by the subject's statement that they reviewed the final result and the calculation steps that had been performed. The following is an excerpt from the interview transcript with the TPA subject.

PN0023 : Did you double-check your answers?

TPA0024 : Yes, I tried to look at the final results again.

PN0025 : How did you check them?

TPA0026 : I'll review the steps again, especially the calculations I performed.

PN0027 : Can you explain which part you checked?

TPA0028 : I looked at the multiplication of the algebraic expressions and the final result. Was it correct.

PN0029 : Did you match your answer with what was asked in the problem?

TPA0030 : Yes, because the question asked for both area and perimeter, so I wrote both in the conclusion.

PN0031 : Are you sure the result is correct?

TPA0032 : I think so because I followed the steps I know.

PN00033 : Is there another, simpler or faster way that you used to obtain the same result?

TPA0034 : No

Based on the analysis results, the TPA subject was able to understand the information in the problem and determine the appropriate solution strategy. During the solution implementation stage, the subject used correct concepts, but errors still occurred in the calculations, resulting in an inaccurate final result. During the review stage, the subject began to demonstrate reflective efforts by revisiting the solution steps, but was not yet able to identify and correct the errors that occurred.

Thus, the TPA subjects fall into the category of pseudo-correct thinking. According to Subanji (2006), pseudo-correct thinking occurs when students use correct concepts and follow appropriate procedures but lack a deep understanding, preventing them from detecting the errors they make. The indicators met include the use of appropriate concepts, the presence of non-conceptual errors (calculations), and an insufficiently developed reflection process.

3) Students' Pseudo-Thinking Process with Low Self-Confidence.
ADR Subject in Understanding the Problem

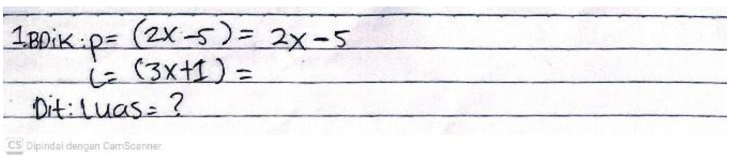


Figure 10. Problem Understanding in ADR Subjects

Based on Figure 10, in Polya's stage of Understanding the Problem, subject ADR explained the known information, such as the length of the rectangle being $(2x-5)$ m and the width being $(3x+1)$ m. In addition, the subject was able to understand what was being asked, namely to determine the perimeter of the rectangle in algebraic form and its area when $x = 10$. Although the subject did not explicitly write down what was being asked on the answer sheet, based on the interview results, the subject was able to accurately state the objective of the problem. This indicates that the subject's understanding of the problem was implicit—understood but not expressed in written form. The following is an excerpt from the interview transcript with subject ADR.

PN003 : May I ask you about the problem that was given earlier?

ADR004 : Sure, go ahead

PN005	:	Based on the question you gave me earlier, do you think it's easy, moderate, or difficult?
ADR006	:	I think this problem is difficult.
PN007	:	From the questions you've already worked on, what information do you know from those questions?
ADR008	:	What I know here is that the length is $2x - 5$ m, while the width is $3x + 1$ m
PN009	:	Okay. So what is the question?
ADR0010	:	The perimeter of the rectangle in terms of x and the area of the rectangle when x = 10.

ADR Subject in Planning the Solution

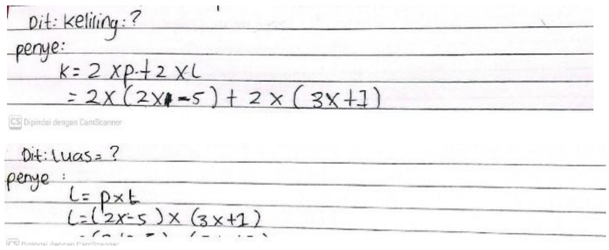
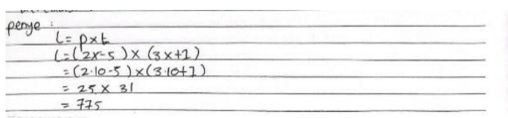


Figure 11. Planning the Solution for the ADR subject

Based on Figure 11, in Polya's stage of *Planning the Solution*, subject ADR demonstrated the ability to determine the initial steps for solving the problem. The subject then planned to use the appropriate formulas, namely the formula for the area of a rectangle $p \times l$ and the formula for the perimeter $2(p + l)$.The following is an excerpt from the interview transcript with subject TPA.

PN0011	:	After knowing the information from the problem, what step did you take next?
ADR0012	:	After reading the problem, I first wrote down what was known and what was asked, so that it would be easier for me to understand. After that, I started planning which formula to use to solve the problem.
PN0013	:	What formula will you use after reading the problem?
ADR0014	:	I used the formula for the area of a rectangle, which is length times width. Then, for the perimeter, I used the formula two times the sum of the length and width, or $2\ (p + l)$.

ADR Subject in Solving the Problem According to the Plan



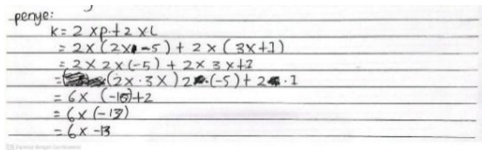


Figure 12. ADR Subject in Solving the Problem According to the Plan

Based on Figure 12, in Polya's stage of *Solving the Problem According to the Plan*, subject ADR attempted to apply the strategy that had been previously planned, namely using the formulas for the area $L = p \times l$and the perimeter $K = 2(p + l)$. The subject substituted the values of the length $2x - 5$and the width $3x + 1$into the appropriate formulas and tried to perform algebraic operations to obtain the result. However, during the calculation process, there was an error in operating the algebraic expressions—the subject made a computational mistake and obtained the area result as 775 m². The following is an excerpt from the interview transcript with subject TPA.

PN0015	:	How did you start working on the problem?
ADR0016	:	I started by finding the area first because I thought it was easier. So, I directly substituted the value $x = 10$ into the length and width. The length became $2 \times 10 - 5$, and the width became $3 \times 10 + 1$.
PN0017	:	Next, how did you operate it?
ADR0018	:	After that, I calculated the result. The length became 25 and the width 31. Then I multiplied 25 by 31 and got the result of 7752 square meters.
PN0019	:	How did you find the perimeter?
ADR0020	:	For the perimeter, I used the formula $2(p + l)$. I substituted the length and width values, but I didn't replace.

Subject ADR in Review

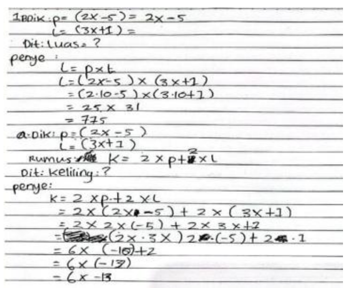


Figure 13. Rechecking by subject ADR

Based on Figure 13, in Polya's stage of *Checking the Solution*, subject ADR did not perform a re-examination process of the answer obtained. This can be seen from the subject's statement during the interview, indicating that they did not have time to check their answer because they felt it was already correct. In addition, the subject also did not write a conclusion at the end of the solution, which shows that the checking stage was not carried out completely. Therefore, subject ADR can be categorized as having pseudo-wrong thinking at the *Checking the Solution* stage, since the subject did not perform a recheck and was unaware of possible errors in their answer, even though they were confident that the answer was correct. The following is an excerpt from the interview transcript with subject TPA.

PN0021	:	Did you check your answer again?
ADR0022	:	No, I didn't have time to check it again because I thought it was already correct.
PN0023	:	Did you make a conclusion?
ADR0024	:	No, I forgot to write the conclusion at the end of my answer.
PN0025	:	Are you sure your answer is correct?
ADR0026	:	Yes, I'm pretty sure because I followed the steps I know.

Based on the analysis results of subject ADR with low self-confidence, at the stage of understanding the problem, the subject experienced difficulties in identifying the known and asked information. The subject appeared hesitant and uncertain about their own answers. During the planning and execution stages, the subject tended to use unsystematic methods that were not aligned with the correct concepts. The subject also seemed unsure when applying formulas and frequently made mistakes in algebraic operations.

During the review stage, the subjects did not conduct a thorough check and tended to immediately accept the results obtained without evaluation. However, when interviewed and given prompts, the subjects began to realize their mistakes and were able to correct some of their answers.

Consequently, the subject of ADR falls into the category of pseudo-erroneous thinking. According to Subanji (2006), pseudo-erroneous thinking occurs when students produce incorrect answers due to errors in understanding concepts or procedures; however, after reflection, students are able to correct these errors to arrive at a more accurate answer.

The findings of this study indicate that students with different levels of self-confidence demonstrate distinct characteristics of pseudo-thinking when solving algebraic problems. Students with high and moderate self-confidence tended to exhibit pseudo-correct thinking, whereas students with low self-confidence showed pseudo-erroneous thinking. These findings suggest that self-confidence influences not only students' willingness to engage in mathematical problem solving but also the quality of their cognitive monitoring during the problem-solving process.

Students with high self-confidence were able to identify relevant information, select appropriate formulas, and follow systematic problem-solving steps based on Subanji (2006) framework. However, they still made computational errors and failed to critically evaluate their solutions. This condition occurred because high self-confidence appeared to encourage students to trust their initial reasoning without sufficiently re-examining the conceptual basis of their answers. As a result, students produced answers that appeared logically structured but were not fully supported by deep conceptual understanding. This finding is consistent with the pseudo-thinking theory proposed by Prasetiawan, et al. (2023), which explains that students may arrive at seemingly correct solutions without genuine conceptual comprehension. It also supports the findings of Subanji, who found that pseudo-correct thinking occurs when students apply memorized procedures without fully understanding the underlying concepts.

Similarly, students with moderate self-confidence demonstrated the ability to understand the problem, organize solution steps, and perform algebraic operations. However, they still encountered calculation errors and were unable to identify these mistakes during the reflection stage. This finding suggests that moderate self-confidence supports procedural engagement but does not automatically guarantee conceptual accuracy. Students tended to rely on familiar algorithms rather than analytical reasoning. This result supports previous research by Salsabila & Ervin (2022), who reported that students with sufficient self-confidence may still experience pseudo-correct thinking because confidence is not always accompanied by conceptual mastery.

In contrast, students with low self-confidence showed hesitation in understanding problems, uncertainty in selecting formulas, and inconsistencies in algebraic operations. They tended to produce incorrect answers and did not initially perform solution verification. However, during interviews and reflective prompts, these students were able to recognize and correct some of their mistakes. This finding indicates the presence of pseudo-erroneous thinking, in which incorrect answers stem from incomplete understanding but can be revised after reflection. This result is in line with the findings of Khoirunnisa & Rahayu (2025), who emphasized that reflective processes can help students reconstruct fragmented mathematical understanding.

CONCLUSION

Based on The Conclusion should contain the confirmation of the problem that has been analyzed in result and discussion section. The Conclusion should contain the confirmation of the problem that has been analyzed in result and discussion section. The Conclusion should contain the confirmation of the problem that has been analyzed in result and discussion section.

In general, self-confidence influences students' thinking processes in solving mathematical problems. A higher level of self-confidence encourages greater courage and effort in problem-solving, although it is not always accompanied by deep conceptual understanding.

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