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Profile of Students' Mathematical Beliefs at State Junior High School 1 Palu in Solving Algebra Problems Viewed from Learning Styles

Nurhidayah*, Pathuddin, Fajriani, Mubarik
Math Education, Tadulako University, Palu, 94118, Indonesia

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** Corresponding author:*

E-mail: dayya1006@gmail.com

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A B S T R A C T

This study aims to describe the profile of students' mathematical beliefs in solving algebra problems at state junior high school 1 Palu, viewed from their learning styles. Mathematics learning, particularly algebra, often faces obstacles due to its abstract symbolic nature, which affects students' confidence. Self-efficacy, as part of mathematical belief, plays an important role in students' persistence and strategies when solving problems. This research employed a qualitative approach with a descriptive design. Data were collected through a learning style questionnaire, written algebra tests, and semi-structured interviews. The analysis was conducted based on self-efficacy indicators, namely magnitude, strength, and generality. The results showed that students with a visual learning style had high self-efficacy, confidence in constructing equations, persistence in solving problems, and verification of answers. Students with an auditory learning style demonstrated low self-efficacy, doubts in algebraic manipulation, and lack of confidence in generalizing strategies. Meanwhile, students with a kinesthetic learning style exhibited high self-efficacy, confidence in representing variables, persistence in solving problems, and ability to recheck results. These findings emphasize that learning styles influence students' mathematical beliefs, particularly self-efficacy, in algebra problem solving. The study concludes that aligning instructional strategies with students' learning styles can strengthen self-efficacy and foster positive mathematical beliefs.

1. Introduction

Mathematics is one of the disciplines that plays a fundamental role in developing students' logical, systematic, and critical thinking skills. In the context of formal education, mathematics is not merely regarded as a collection of formulas and

procedures, but rather as a means to cultivate higher-order thinking skills that are essential for facing everyday challenges as well as the advancement of science (Ramadan, 2020). However, preliminary studies indicate that students' mathematical problem-solving abilities remain low (Rianti et al., 2020). Nevertheless, mathematics learning in schools continues to encounter various obstacles, particularly in terms of understanding abstract concepts and solving problems that demand advanced reasoning skills (Radiusman, 2020). These difficulties are also reflected in students' low mathematics achievement, thereby necessitating the implementation of more interactive learning models (Saputra et al., 2019).

One of the mathematics topics often considered difficult by students is algebra. This material is introduced from elementary to secondary school levels, yet many students still struggle to understand it (Isfayani, 2023). According to Rohim & Prayogi (2023), algebra is a complex topic because it involves abstract symbols that are not easily connected to students' concrete experiences. Difficulties in algebra are not only related to symbolic abstraction but also emerge in the form of misconceptions when students attempt to construct conceptual understanding. Ngaba et al (2023) found that misconceptions in algebraic thinking occur in generational, transformational, and global meta-level activities, particularly among low-achieving students. These difficulties affect learning mastery, especially in simplifying algebraic expressions, forming equations, and solving word problems. Such challenges not only impact academic achievement but also influence how students build confidence in facing mathematical tasks.

The problems in learning algebra are not only related to cognitive aspects but also to non-cognitive aspects such as students' confidence and attitudes toward mathematics. One of the important factors influencing students' success is mathematical belief, namely students' belief in their own ability to understand and solve mathematical problems (Aziz et al., 2021; Salsabila, 2023). Mathematical belief functions as an internal resource that affects motivation, perseverance, and the strategies students employ in facing academic challenges (Sari & Afriansyah, 2022). Ernest (1989), as cited in Muhtarom et al (2024), stated that mathematical belief consists of three aspects beliefs about mathematics education, beliefs about the social context, and beliefs about oneself. Among these three aspects, self-belief or self-efficacy belief becomes the main focus of this study.

Self-efficacy belief refers to an individual's confidence in their ability to plan and carry out actions to achieve specific goals, including solving challenging mathematical tasks (Bandura, 1997). Students with high self-efficacy beliefs tend to have stronger motivation, greater persistence when facing difficulties, and confidence in solving mathematical problems. Conversely, students with low self-efficacy beliefs often feel doubtful, give up easily, and are reluctant to try new strategies. Therefore, understanding students' self-efficacy belief profiles in mathematics learning is essential to reveal how they confront complex intellectual challenges, particularly in algebra problem-solving. This is consistent with the study by Barani et al (2026), which revealed that the self-efficacy profiles of junior high school students in Palu in solving algebraic problems vary according to their

level of mathematical ability, thereby reinforcing the importance of examining students' internal factors in algebra learning.

Based on interviews with mathematics teachers at State Junior High School 1 Palu, it was revealed that most students still hold negative views toward mathematics. Many perceive mathematics as a difficult, confusing, and less engaging subject. This is particularly evident in algebra learning, where students tend to struggle with concepts involving letter symbols or variables. Teachers also emphasized that students with higher mathematical ability generally demonstrate stronger self-efficacy beliefs, whereas those with lower ability often feel incapable even before attempting. This study highlights the importance of paying attention to self-belief aspects in mathematics learning.

Students' learning styles also influence their understanding of algebra. Visual learners tend to grasp material more easily through images and symbols, auditory learners respond better to verbal explanations, while kinesthetic learners usually learn through physical activities and direct experiences (Waryani, 2021; Nurfadila, 2023). A mismatch between students' learning styles and teachers' instructional methods can reduce motivation as well as self-efficacy beliefs. Conversely, alignment between teaching methods and learning styles can enhance students' confidence in learning mathematics (Aliffianti et al., 2022). Previous research by Olawale & Hendricks (2024) emphasized that self-efficacy affects students' motivation, thinking processes, and emotional regulation when facing academic challenges.

Meanwhile, (Fauziah et al., 2024) found that mathematical belief represents an integration of attitudes and values that are interconnected, indicating that success in mathematics learning is determined not only by cognitive ability but also by students' beliefs in themselves. This study differs from previous research, which generally discussed mathematical belief without considering learning styles. Specifically, it focuses on the profile of mathematical beliefs of students at State junior High School 1 Palu in solving algebra problems from the perspective of learning styles. The focus of this study provides a new contribution, as the relationship between learning styles and self-efficacy belief in solving algebra problems has not yet been extensively explored.

This study not only broadens the understanding of how students build self-confidence in learning mathematics but also demonstrates how differences in learning styles shape the ways they confront algebraic challenges. Therefore, the purpose of this research is to describe the profile of mathematical beliefs of students at State Junior High School 1 Palu in solving algebra problems, viewed from the perspective of learning styles. By understanding these profiles, teachers are expected to design more adaptive instructional strategies that align with students' individual characteristics, thereby enhancing self-efficacy beliefs in algebra learning.

2. Methodology

This study employs a qualitative approach with a descriptive research design. The research was conducted at State Junior High School 1 Palu during the even semester of the 2025/2026 academic year. The research subjects were determined based on the results of a learning style questionnaire developed by Yaumi (2017), which identified students with visual, auditory, and kinesthetic learning styles as the focus of the study. The research instruments consist of the primary instrument, namely the researcher, and supporting instruments, namely a learning style questionnaire, a written test on the topic of algebra, and semi-structured interview guidelines developed based on the measurement of self-efficacy proposed by Bandura as cited in Alifa & Dewi (2023), which are presented in Table 1:

Table 1. Indicators of Self-Efficacy Belief in Solving Mathematical Problems

Dimension	Description	Indicators
Magnitude	Related to the level of confidence an individual has in determining the difficulty of tasks they believe they can accomplish	1. Students are optimistic in facing tasks 2. Students feel confident in completing tasks
Strength	Related to the persistence of individuals in carrying out tasks even when facing difficulties	1. Students continue to make their best effort despite challenges 2. Students are committed to completing tasks
Generality	Related to the level of confidence and ability of Individuals to generalize from previous experiences	1. Students are able to respond well to various situations and conditions 2. Students use their prior experiences as a step toward achieving success

The learning style questionnaire was used to classify students based on their dominant learning tendencies, the written test was employed to assess students' problem-solving abilities, while the interview guide served to explore more deeply students' mathematical beliefs, particularly the aspect of self-efficacy. The data collection techniques were carried out through several stages. First, students were identified based on the results of the learning style questionnaire. Second, students were given a written test on algebra material to examine their ability to understand the problem context, formulate equations, and select appropriate solution methods. Third, interviews were conducted after the written test to explore students' beliefs about their self-efficacy in solving mathematical problems. Fourth, the entire process of testing and interviewing was documented in the form of field notes and interview recordings.

Data quality assurance was carried out using the *member check* technique, which aims to test the validity of the data by confirming the findings obtained by the researcher with the research subjects. Data analysis was conducted in three stages: (1) data condensation, by reducing students' responses according to the indicators of mathematical belief; (2) data presentation, organized in the form of tables,

narrative descriptions, and interview excerpts; and (3) conclusion drawing and verification, emphasizing that the interpretation of self-efficacy dimensions (magnitude, strength, and generality) was derived from the comparison between written test results and interview data, and subsequently reconfirmed with participants through member checking. This clarification strengthens the linkage between the data analysis procedures in the methodology and the interpretation of results presented in the findings section.

3. Results and Discussion

The interpretation of the dimensions *magnitude, strength,* and *generality* for each subject was obtained through a step-by-step data analysis process. In the reduction stage, students' responses from written tests and interviews were selected and simplified according to the self-efficacy indicators. In the presentation stage, the reduced data were displayed in the form of tables, narratives, and interview excerpts to highlight the mathematical belief patterns of each subject. The final stage was drawing conclusions, which involved connecting the written test results with the interview findings and confirming them through the *member check* technique with the research subjects. Thus, the self-efficacy profiles presented in this section are the outcome of a systematic and valid analysis, rather than a mere description from a single source of data. Based on the results of the learning style questionnaire developed by Yaumi., (2017), which was administered to Grade VII Literacy students, the findings are presented in Table 2 below.

Table 2. Research Subjects

Subject Code	Learning Style
AV	Visual
NA	Auditory
LK	Kinesthetic

For a more in-depth analysis, the selection of subjects was carried out based on the results of the learning style questionnaire, the highest scores in each learning style category, recommendations from the mathematics teacher, and the students' willingness to participate. Consequently, research subjects were identified with visual, auditory, and kinesthetic learning styles. Data were then collected through written tests and interviews to illustrate students' mathematical beliefs in the aspect of self-efficacy belief, based on the self-efficacy indicators proposed by Bandura (1997), particularly in the problem-solving stage. The results of the analysis are discussed to provide an overview of how differences in learning styles influence students' self-efficacy beliefs in solving algebraic problems.

1) Data Analysis of Subject AV in Solving Algebraic Problems

To provide a deeper understanding of students' mathematical beliefs with a visual learning style, this section presents the results of an in-depth interview with Subject AV, as shown in Table 3 below:

Table 3. Interview Transcript of Subject AV on Self-Efficacy in Algebraic Problem Solving.

Dimension	Interview Transcript		
Magnitude	PN-011	:	Well, from the information in the problem, what makes you confident that you can solve it?
	AV-012	:	I am confident I can solve this problem because I already know what is given and what is being asked in the problem.
	PN-013	:	How confident are you that you can solve the problem? If rated from 1 to 10, at what number would you place yourself?
	AV-014	:	At number 7, because I already know what is given and asked, but I am still a little confused about the process.
	PN-015	:	Do you think this problem is easy, moderate, or difficult?
	AV-016	:	I think it is moderate. Not too difficult, but it requires carefulness.
Strength	PN-019	:	From your work, what steps did you take to solve the problem?
	AV-020	:	First, I determined what was given and what was asked in the problem. Then I substituted, formed an equation, and finally found the result.
	PN-021	:	What makes you confident that the steps you used were correct?
	AV-022	:	Because I already know the steps to solve it.
	PN-023	:	Here you wrote the equation $\frac{1}{2}x = 4$. At this stage, were you immediately confident you could solve it?
	AV-024	:	Yes, I was confident. Because I know that if there is a fraction in the equation, both sides can be multiplied by the same number to make the equation simpler.
	PN-025	:	Can you explain how you solved this step to get the result?
	AV-026	:	I multiplied both sides by 2 so that the half would be eliminated.
	PN-027	:	Okay. If you encounter difficulties while solving the problem, are you confident you would persist in solving it or would you give up?
	AV-028	:	Yes, I am confident. I will keep trying to solve the problem until I get the result.
	PN-029	:	Now that you have solved the problem, how do you feel about it?
	AV-030	:	I feel happy and relieved.
	PN-031	:	After obtaining the result, did you check your answer again?
	AV-032	:	Yes, I substituted it back into the problem to make sure. Since half of 8 is 4, the answer is correct.
Generality	PN-035	:	Okay. If you are given a problem in the form of direct calculation, are you confident you can solve it?
	AV-036	:	Yes, I am confident.
	PN-037	:	Can you explain the concept you use when you get a similar problem?
	AV-038	:	Yes. First, I determine what is given and what is asked in the problem. Then I substitute and orm an equation. After that, I find the result.

Based on the results of the interview, Subject AV was able to correctly construct a simple algebraic equation. AV wrote the equation $\frac{1}{2}x = 4$, then multiplied both sides by 2 to obtain $x = 8$. This answer demonstrates that AV understands the basic algebraic procedure and is able to connect the information from the problem with

the appropriate solution steps. Accordingly, this is shown in AV's written test answer sheet in Figure 1 below:

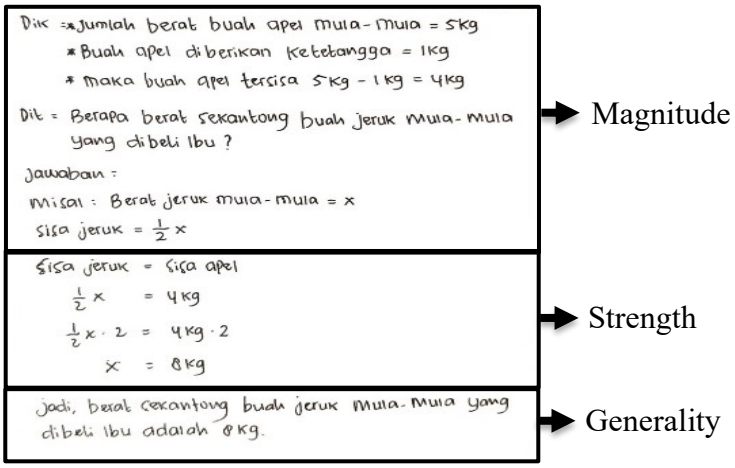

Figure 1. Written Test Answer Sheet of Subject AV

Based on the findings of the study, Subject AV with a visual learning style demonstrated good self-efficacy across the three indicators: magnitude, strength, and generality. In the magnitude dimension, AV was able to face difficulties while continuing to work on the problem, showing confidence in personal ability as well as persistence in maintaining the chosen strategy. In the strength dimension, AV exhibited strong commitment to completing the problem despite experiencing some confusion, and displayed confidence after obtaining the correct answer. Meanwhile, in the generality dimension, AV was not only able to apply the strategies that had been learned but also verified the final result and explained the solution steps in sequence, reflecting a comprehensive understanding of the problem-solving process.

These findings are consistent with the study conducted by Ziliwu & Mahmudi (2025), which stated that students with high self-efficacy tend to effectively use mastered strategies to solve problems and recheck their answers to ensure accuracy. They also align with the research presented by Mukarromah et al (2024), which showed that students with positive beliefs in mathematics tend to have confidence in the chosen solution strategies and demonstrate persistence in the problem-solving process. Thus, AV's self-efficacy profile not only reflects confidence in solving problems but also indicates the development of positive mathematical beliefs. This emphasizes that a visual learning style supports students' confidence in their mathematical abilities.

2) Data Analysis of Subject NA in Solving Algebraic Problems

To provide a deeper understanding of students' mathematical beliefs with a auditory learning style, this section presents the results of an in-depth interview with Subject NA, as shown in Table 4 below:

Table 4. Interview Transcript of Subject NA on Self-Efficacy in Algebraic Problem Solving

Dimension			Interview Transcript
Magnitude	PN-007	:	Is there any part of the problem that you already know or understand?
	NA-008	:	I still don't understand how to solve it. However, from the problem I already know what is given and what is being asked.
	PN-009	:	Well, from the information in the problem, what makes you confident that you can solve it?
	NA-010	:	Actually, I am not very confident that I can solve this problem. I still tried to work on it because I already know what is given and what is being asked.
	PN-011	:	When you first read this problem, what did you feel?
	NA-012	:	I felt doubtful. I think the problem is quite difficult because I have to construct the equation myself.
Strength	PN-017	:	Okay, what steps did you take to solve the problem?
	NA-018	:	First, I wrote down what was given and what was asked, then I represented the weight of the oranges with x, then I made an equation and calculated to get the result.
	PN-021	:	When you wrote the remaining oranges are equal to $\frac{1}{2}x$, did you really understand or were you still unsure?
	NA-022	:	I was still unsure, because I knew half of the oranges in the bag were eaten, so the remainder is half of x. But I wasn't sure whether writing it as $\frac{1}{2}x$ was correct.
	PN-023	:	Okay. Here you wrote $\frac{1}{2}x = 4$, how did you construct that equation?
	NA-024	:	Because the problem stated that the remaining weight of oranges is equal to the remaining weight of apples.
	PN-027	:	How did you get the result $x = 4$?
	NA-028	:	Here I wrote $\frac{1}{2}x = 4$. Then I multiplied both sides by 2 to eliminate the fraction. After that, I wrote $\frac{1}{2}x$ times 2 equals 4 times 2. Then I wrote it as $4x = 8$. Then x goes down and 4 moves to the left, so x equals 8 minus 4. Thus, I obtained $x = 4$.
	PN-029	:	At that time, were you confident with the result you obtained?
	NA-030	:	No, I wasn't confident. I felt something was not quite right, but I didn't know what was wrong.
	PN-031	:	After you finished solving the problem, did you check your answer again?
	NA-032	:	No.
	PN-035	:	If you encounter difficulties while solving the problem, are you confident you would persist or would you give up?
	NA-036	:	Yes, I am confident. I will keep trying to solve it.
	PN-037	:	Now that you have solved the problem, how did you feel?
	NA-038	:	Happy.
Generality	PN-039	:	If you are given a problem in the form of direct calculation, are you confident you can solve it?
	NA-040	:	Not very confident, because I don't yet know what the problem will look like.

PN-041	:	Can you explain the concept you use when you get a similar problem?
NA-042	:	I look for what is given and what is asked in the problem, then I represent and construct an equation, and after that I find the result.

Based on the interview results, Subject NA wrote the equation 1/2x = 4 and then multiplied both sides by 2. However, in the following step, the procedure was not consistent with the correct algebraic process. NA wrote 4x = 8 and then simplified it to x = 4. This answer indicates an error in algebraic manipulation, resulting in an incorrect final outcome. Accordingly, this is shown in NA's written test answer sheet in Figure 2 below:

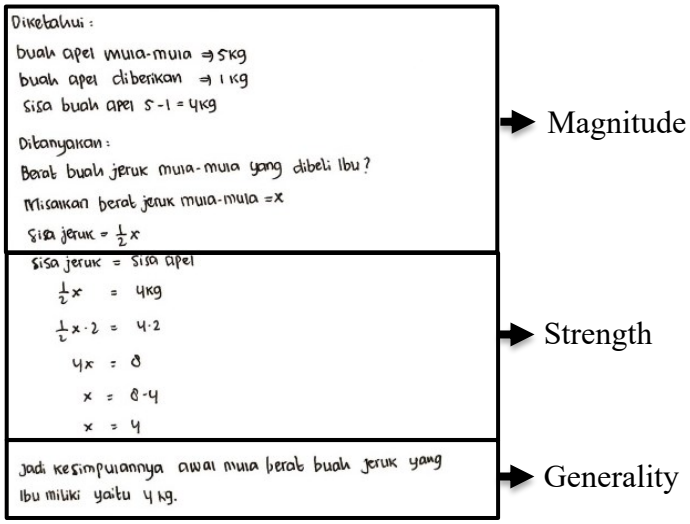

Figure 2. Written Test Answer Sheet of Subject NA

Based on the findings of the study, Subject NA with a visual learning style demonstrated low self-efficacy across the three indicators: magnitude, strength, and generality. In the magnitude dimension, NA showed doubt in personal ability, experienced difficulties, and lacked confidence when facing challenging problems, although still attempted to write down the basic information as an initial step. In the strength dimension, NA displayed commitment to completing the problem, but strong uncertainty about personal ability led to less optimal results and reflected weak confidence in the problem-solving process. Meanwhile, in the generality dimension, NA was able to repeat previously used solution steps, but confidence in handling new types of problems remained low, indicating that the potential to expand self-belief had not yet developed fully. These findings are consistent with the study conducted by Misluna et al (2026), which showed that students with low self-efficacy tend to be passive, rely on external assistance, and exhibit weak confidence even in simple problems, directly impacting their low cognitive achievement. They are also in line with the research presented by Iswan et al (2023), which emphasized that low mathematical belief causes students to complain, feel difficulties, and lack confidence in their ability to solve mathematical problems, thereby affecting their academic achievement. Thus, the doubts and weak self-

perception demonstrated by NA reflect negative mathematical beliefs, making NA more passive and less confident in facing algebraic problems.

3) Data Analysis of Subject LK in Solving Algebraic Problems

To provide a deeper understanding of students' mathematical beliefs with a kinesthetic learning style, this section presents the results of an in-depth interview with Subject LK, as shown in Table 5 below:

Table 5. Interview Transcript of Subject LK on Self-Efficacy in Algebraic Problem Solving

Dimension	Interview Transcript		
Magnitude	PN-007	:	Is there any part of the problem that you already know or understand?
	LK-008	:	Yes. After reading the problem, I found that the initial weight of apples was 5 kg, half of the oranges in the bag were eaten by the family, and 1 kg of apples was given to the neighbor.
	PN-009	:	Is there anything else known from the problem?
	LK-010	:	Yes. The problem states that the mother noticed the weight of apples and oranges was the same. It also asks for the initial weight of the bag of oranges.
	PN-011	:	Even though you said you didn't fully understand, are you still confident you can start solving the problem?
	LK-012	:	Yes, I am confident I can start solving it little by little by writing down the information I already understand.
	PN-013	:	What makes you brave enough to start even though you don't fully understand?
	LK-014	:	Usually, once I know what is given and what is asked, I understand better and can continue to the next steps.
	PN-015	:	From the information in the problem, what makes you confident you can solve it?
	LK-016	:	Because I already know what is given and what is asked in the problem.
Strength	PN-017	:	After you identified what is given and what is asked, what did you do next?
	LK-018	:	I thought about the steps to solve the problem by recalling the material taught by the teacher.
	PN-021	:	How about the oranges, since the initial weight is not given?
	LK-022	:	Since the initial weight of the oranges is unknown, I represented it with x.
	PN-023	:	Why were you confident in representing the oranges with x?
	LK-024	:	Because in algebra, if the value is unknown, it is usually represented first so that an equation can be formed. So I was confident that was the correct step.
	PN-027	:	The problem states "half of the oranges were eaten." How did you convert that into mathematical form?
	LK-028	:	Since half of the oranges in the bag were eaten, the remaining oranges are half of x, so I wrote $\frac{1}{2}x$.
	PN-029	:	Then how did you construct the equation?

	LK-030	:	Because the problem also states that the remaining oranges equal the remaining apples, and the remaining apples are 4 kg, I wrote the equation $\frac{1}{2}x = 4$.
	PN-031	:	How did you solve the equation to get the result?
	LK-032	:	I multiplied both sides by 2 to eliminate the fraction. Then I wrote $\frac{1}{2}x \times 2 = 4 \times 2$, so I obtained $x = 8$.
	PN-033	:	What makes you confident that the steps you used were correct?
	LK-034	:	Because I understood the steps of the solution, I was confident that my answer was correct.
	PN-035	:	After finishing the problem, did you check your answer again?
	LK-036	:	Yes. I checked again that half of 8 is 4, which equals the remaining apples. So I became more confident the answer was correct.
	PN-037	:	If you encounter difficulties while solving the problem, are you confident you would persist or give up?
	LK-038	:	I am confident I would persist until I get the answer.
	PN-039	:	Now that you have solved the problem, how did you feel?
	LK-040	:	I felt satisfied.
Generality	PN-041	:	If you are given a problem in the form of direct calculation, are you confident you can solve it?
	LK-042	:	Yes, I am confident.
	PN-043	:	If the numbers are changed but the problem form is the same, are you still confident you can solve it?
	LK-044	:	Yes, because the steps remain the same, only the numbers are different.
	PN-045	:	Can you explain the concept you use when you get a similar problem?
	LK-046	:	Yes. First, I identify what is given and what is asked in the problem, then represent the unknown, construct an equation based on the information, and finally find the result.

Based on the interview results, Subject LK wrote the equation $\frac{1}{2}x = 4$ and then multiplied both sides by 2, obtaining the final result $x = 8$. This answer shows that LK was able to understand the steps in solving the algebraic problem and successfully completed it correctly. Based on the findings of the study, Subject NA with a visual learning style demonstrated good self-efficacy across the three indicators: magnitude, strength, and generality. In the magnitude dimension, LK showed strong confidence in facing the problem even though the issue was not fully understood, by writing down the known and asked information and making assumptions as an initial step, which reflects optimism and self-confidence. In the strength dimension, LK displayed strong commitment to completing the problem until obtaining the correct answer, continued to persevere despite difficulties, and rechecked the calculation results, thereby reinforcing strong confidence in mathematical ability. Accordingly, this is demonstrated in LK's written test answer sheet in Figure 3 below:

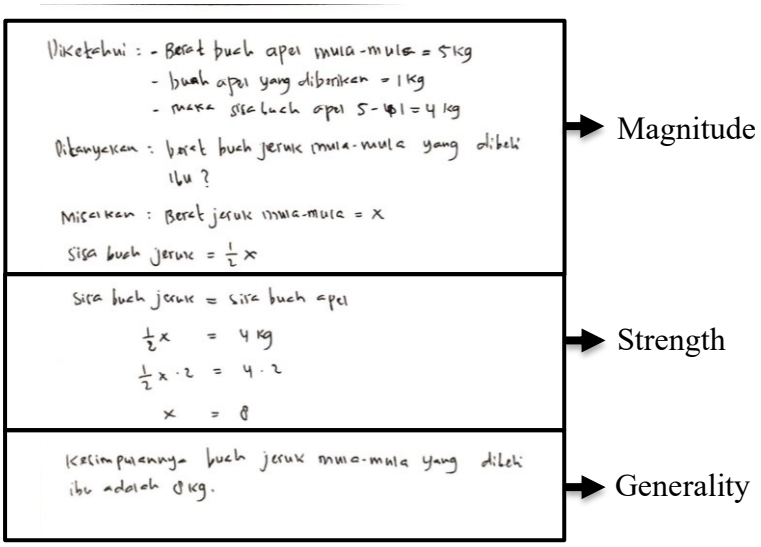

Figure 3. Written Test Answer Sheet of Subject LK

Meanwhile, in the generality dimension, LK was able to maintain consistent problem-solving strategies, use prior experience as a guide, and demonstrated confidence that similar problems could be solved with the same steps even if the numbers differed. These findings are consistent with the study conducted by Yang et al (2024), which showed that students with high levels of self-efficacy have greater learning engagement, more consistent effort, and better academic achievement compared to students with low levels of self-efficacy. They are also in line with the research presented by Mukorromah et al (2025), which stated that students with high belief in mathematics demonstrate confidence, perseverance, and better problem-solving outcomes because they hold positive views toward mathematics. Thus, LK's profile indicates that a kinesthetic learning style supports the development of positive mathematical beliefs, characterized by self-confidence, consistent strategies, and the ability to utilize prior learning experiences.

Data analysis shows that learning styles play an important role in shaping students' mathematical beliefs, with self-efficacy serving as the main indicator distinguishing between positive and negative confidence in mathematical ability. Subjects with visual (AV), auditory (NA), and kinesthetic (LK) learning styles demonstrated differences closely related to the formation of mathematical beliefs. Visual and kinesthetic learners (AV and LK) exhibited high self-confidence, consistent strategies, and the ability to verify results, which reflect the development of positive mathematical beliefs. In contrast, auditory learners (NA) displayed hesitation, procedural errors, and a lack of rechecking, resulting in mathematical beliefs that tend to be negative. These findings indicate that learning styles play a crucial role in shaping students' mathematical beliefs, with self-efficacy as the key factor differentiating positive and negative confidence in mathematical ability. This is consistent with Sakinah et al (2019), who found that self-efficacy has a positive and significant effect on students' entrepreneurial intentions, thereby reinforcing the view that self-confidence is a universal factor influencing motivation and achievement across both academic and non-academic contexts.

Thus, there are similarities between visual and kinesthetic students, both of whom demonstrate high self-confidence, consistent strategies, and the habit of verifying their results. However, the difference lies in how they build their confidence: visual learners benefit more from symbolic representations and diagrams, whereas kinesthetic learners gain confidence through direct activities and prior experiences. In contrast, auditory students exhibit markedly different characteristics, such as hesitation, procedural errors, and a lack of rechecking, resulting in weaker self-efficacy. These differences emphasize that success in solving algebraic problems is not determined solely by cognitive ability, but also by the alignment of learning styles with the characteristics of the tasks and the level of self-efficacy possessed by the students. This finding is consistent with Bandura's theory of *magnitude, strength,* and *generality,* and supports Ernest's view that mathematical beliefs are shaped by psychological, social, and experiential factors within students.

These findings also provide practical implications for mathematics teachers, namely the need to adjust instructional strategies according to students' learning styles. Visual learners benefit more from symbolic representations and diagrams; auditory learners require structured verbal explanations and opportunities for discussion; while kinesthetic learners more easily grasp concepts through direct activities. By tailoring teaching methods to students' learning styles, teachers can strengthen students' self-efficacy, foster positive mathematical beliefs, and enhance active engagement in solving algebraic problems.

4. Conclusion

This study describes the profile of mathematical beliefs of students at state junior high school 1 Palu in solving algebraic problems from the perspective of learning styles. The results show clear differences among students with visual, auditory, and kinesthetic learning styles. Students with a visual learning style demonstrated positive and stable beliefs, characterized by strong self-confidence, perseverance, and the ability to systematically verify solution steps. Students with a kinesthetic learning style also showed positive beliefs, marked by optimism, consistency in maintaining strategies, and the ability to use prior experiences to solve new problems. In contrast, students with an auditory learning style tended to have weaker beliefs, characterized by persistent doubt, low self-confidence, and inconsistent strategies, which limited their problem-solving effectiveness. These findings highlight the importance of adaptive teaching strategies aligned with students' learning styles to foster stronger mathematical beliefs. Future research could expand the context by examining classroom interactions and teaching practices to deepen the understanding of how learning styles shape self-efficacy in mathematics learning.

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