



Profile of Mathematical Beliefs of State Junior High School 1 Palu Students in Solving Two-Variable Linear Equations: Viewed from Gender

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ABSTRACT

This study describes the profile of mathematical beliefs of students at State Junior High School 1 Palu in solving two variable linear equations, viewed from masculine and feminine gender tendencies. A qualitative descriptive approach was employed, involving two Grade VIII students identified through the Bem Sex Role Inventory (BSRI) questionnaire as masculine (SM) and feminine (SF). Data were collected using written tests and semi-structured interviews based on Bandura's self-efficacy framework, covering magnitude, strength, and generality dimensions. The findings show that SM demonstrated strong and positive mathematical beliefs, characterized by confidence in solving complex problems, persistence despite difficulties, and the ability to generalize prior knowledge to new contexts. In contrast, SF exhibited moderately positive beliefs, marked by optimism and commitment but requiring reinforcement in consistency, resilience, and procedural accuracy. These results highlight differences in mathematical beliefs based on gender tendencies and emphasize the importance of considering gender perspectives in mathematics learning. The study provides implications for teaching strategies that strengthen students' confidence and problem-solving abilities.

1. Introduction

Mathematics is one of the disciplines that plays an important role in everyday life. Mathematical concepts are applied in various activities, ranging from simple tasks to complex problems that require in-depth analysis. In the field of education, mathematics occupies a central position as a core subject taught from elementary school to university. The importance of mathematics is reflected in the allocation of learning time, which is relatively greater compared to other subjects (Aprilia & Fitriana, 2022). In addition, through mathematics learning, students' are prepared to develop logical, critical, analytical, and systematic thinking skills, as well as the

ability to collaborate in groups (Saputra, 2019). However, despite receiving a larger portion of learning time, not all students have a good understanding of mathematical material. This indicates that the success of mathematics learning does not only depend on the duration of instruction but also on psychological factors and students' beliefs in their own abilities.

In solving mathematical problems, students are not only required to understand the procedures but also to have confidence in the correctness of the steps they take. This confidence is known as mathematical belief. Fauziah et al. (2024) emphasized that beliefs about mathematics play an important role in the learning process. Students' with positive beliefs are more confident in completing mathematical tasks and are able to evaluate their own abilities. Conversely, students' with negative beliefs tend to experience anxiety, decreased motivation, and reluctance to understand concepts deeply (Sujadi et al., 2024). Thus, mathematical belief becomes a crucial factor influencing students' success in learning mathematics.

Mathematical belief includes beliefs about self-efficacy, views on the relevance of mathematics in everyday life, and motivation to learn it. Bandura (1997) defined self-efficacy as an individual's belief in their ability to organize and execute actions required to achieve specific goals. In the context of mathematics learning, self-efficacy plays an important role in determining problem-solving strategies, persistence in facing difficulties, and the courage to try various approaches. Moreover, self-efficacy strongly influences students' thinking patterns and emotional reactions in decision-making (Sakinah et al., 2018). In line with this, students' ability to solve mathematical problems is often influenced by the level of confidence they possess (Barani et al., 2026). Ernest (1989), as cited by Muhtarom et al. (2024), explained that mathematical belief can be categorized into beliefs about the nature of mathematics, mathematics learning, mathematics teaching, and social aspects that affect understanding.

Problem-solving ability is a core skill in mathematics learning. The National Council of Teachers of Mathematics (NCTM, 2000) emphasized that problem solving is an integral part of the mathematics learning process. Siswono (2008) identified several factors influencing problem-solving ability, including prior experience, mathematical background, motivation, and the structure of the problem. Among these factors, students belief in their own abilities is the most prominent. Students who believe in their abilities tend to be more willing to try and less likely to give up, while those who doubt themselves often struggle to express ideas and find appropriate solutions (Widiani & Pardi, 2024). According to Rianti et al. (2020), problem-solving ability in mathematics is not limited to routine problems but also includes various types of non-routine problems, both applicative, and non-applicative. This indicates that problem solving requires logical and systematic thinking skills, as well as self-confidence in facing diverse forms of problems. One topic that demands problem-solving skills is the system of linear equations in two variables, which requires students to understand the context of the problem, formulate equations, and select appropriate solution methods.

In addition to internal factors such as self-efficacy and self-confidence, gender differences also influence the way students learn mathematics. Tunnajach (2021) stated that female students generally emphasize concrete, practical, emotional, and personal aspects, while male students tend to focus on abstract and objective aspects. The issue of gender differences in mathematics achievement remains a matter of debate. Furthermore, gender has been shown to correlate with psychological aspects that affect mathematics achievement (Awofala, Lawani, & Adeyemi, 2020). These differences have implications for how students understand and solve mathematical problems. Thus, gender is one of the factors that needs to be considered in examining students mathematical belief.

Research on mathematical belief has been widely conducted. Fitriyani (2024) highlighted the relationship between mathematical belief and learning motivation. Pracilia et al. (2023) emphasized the importance of a learning environment that supports exploration and discussion. Widiani & Pardi (2024) showed that a lack of confidence can hinder students' ability to express ideas. However, most of these studies still discuss mathematical belief in general without linking it to specific topics such as systems of linear equations in two variables. In addition, studies on gender differences in mathematical belief at the junior high school level remain limited. Based on the above description, this study aims to describe the profile of students' mathematical belief at State Junior High School 1 Palu in solving problems related to systems of linear equations in two variables, viewed from the perspective of masculine and feminine gender. Therefore, this study is expected to contribute to understanding gender-based differences in mathematical belief and their implications for mathematics teaching strategies in schools.

2. Methodology

This study uses a qualitative approach with a descriptive research type. The research was conducted at State Junior High School 1 Palu in the even semester of the 2025/2026 academic year. The subjects of this study were Grade VIII (Literacy) students who were selected based on the results of a gender questionnaire based on the Bem Sex Role Inventory (BSRI) developed by Bem (1974), resulting in one student with masculine gender tendencies and one student with feminine gender tendencies as the focus of the study. The research instruments consist of the primary instrument, namely the researcher, and supporting instruments in the form of a gender questionnaire, a written test on the topic of Systems of Linear Equations in Two Variables, and semi-structured interview guidelines developed based on the self-efficacy measurement proposed by Bandura as cited in Alifa & Dewi (2023).

The gender questionnaire was administered to classify students according to gender tendencies; the written test was utilized to assess students' problem-solving skills; and the semi-structured interview guide was employed to gain deeper insights into students' mathematical beliefs, with a particular focus on self-efficacy. The data collection process was conducted in four stages. Initially, students were identified through the results of the gender questionnaire. Subsequently, they completed a written test on systems of linear equations in two variables to evaluate their ability

to comprehend problem contexts, formulate equations, and select solution methods. Following the test, semi-structured interviews were administered to further investigate students' self-efficacy beliefs in solving mathematics problems. Finally, all test and interview activities were documented through field notes and audio recordings. These guidelines were constructed according to the dimensions of self-efficacy with the indicators applied in this study, as shown in Table 1.

Table 1. Indicators of Self-Efficacy Beliefs in Mathematical Problem Solving

Dimension	Description	Indicator
Magnitude	Related to the level of an individual's confidence in determining the difficulty level of questions that the individual believes can be solved.	<ol style="list-style-type: none"> 1. Students demonstrate optimism when approaching mathematics problems. 2. Students are confident in their ability to solve mathematics problems using the correct steps.
Strength	Related to the level of an individual's strength when working on problems.	<ol style="list-style-type: none"> 1. Students continue to make their best effort even when encountering difficulties in solving mathematics problems. 2. Students are committed to completing mathematics problems.
Generality	Related to the level of confidence and the individual's ability to generalize previous experiences	<ol style="list-style-type: none"> 1. Students are able to respond well to various types of mathematics problems. 2. Students use their previous experiences as a step in determining success.

Data quality assurance was carried out through member checking, a validation technique in which findings are confirmed with the research participants. Data analysis was conducted in three stages: (1) data condensation, by reducing students' responses according to mathematical belief indicators; (2) data presentation, organized into tables, narrative descriptions, and interview excerpts; and (3) conclusion drawing and verification, emphasizing that the interpretation of the self-efficacy dimensions (magnitude, strength, and generality) was derived from the comparison between written test results and interview data, and subsequently confirmed with participants through member checking. This clarification strengthens the connection between the data analysis procedures in the methodology and the interpretation of results presented in the findings section.

3. Results and Discussion

Based on the results of the Bem Sex Role Inventory (BSRI) questionnaire administered to Grade VIII Literacy students, four categories of gender tendencies were identified. A total of 2 students were classified as masculine, with an average score of $M > 4,9$ and $F < 4,9$. Six students were classified as feminine, with an average score of $F > 4,9$ and $M < 4,9$. No students were categorized as androgynous,

which occurs when both $M > 4,9$ and $F > 4,9$. Meanwhile, 19 students were classified as undifferentiated, with average scores of $M < 4,9$ and $F < 4,9$.

For a more in-depth analysis, one representative subject was selected from each gender category masculine and feminine based on the highest score, recommendations from the mathematics teacher, and the students' willingness to participate. Thus, research subjects with masculine gender tendencies (SM) and feminine gender tendencies (SF) were obtained. Data were subsequently collected through written tests and interviews to illustrate students' mathematical beliefs in to provide an overview of how gender differences influence students' self-efficacy beliefs in solving systems of linear equations in two variables.

Self-Efficacy Belief of Subject SM in Problem Solving

1. Subject SM Self-efficacy Belief on the Magnitude Indicator

The written test results of subject SM on the self-efficacy belief indicator of task difficulty (magnitude) are presented in Figure 1 below.

$$\begin{aligned}
 \text{Paket 1} &= 3(2x + y) + 2(x + 3y) = 39.000 \\
 &= 6x + 3y + 2x + 6y = 39.000 \\
 &= 8x + 9y = 39.000 \\
 \text{Paket 2} &= 2(2x + y) + 5(x + 3y) = 54.000 \\
 &= 4x + 2y + 5x + 15y = 54.000 \\
 &= 9x + 17y = 54.000 \\
 x &= \text{Buku} \\
 y &= \text{Pulpen}
 \end{aligned}$$

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Figure 1. Subject SM Written Responses on the Magnitude Indicator

During the interview stage, subject SM also provided statements that illustrate his self-efficacy belief in magnitude. These statements are presented in Table 2 below.

Table 2. Interview Responses of Subject SM on Self-efficacy Belief in Magnitude

Dialogue	
PZ-001	: Hello, I have a few questions related to the written test I previously gave you. After reviewing and understanding the problem, do you think it is difficult or easy? And are you confident that you can solve it?
SM-002	: Hello. In my opinion, this problem is difficult, but I am confident that I can solve it.
PZ-003	: Well, you said the problem is difficult. What makes you confident that you can solve it?
SM-004	: Because this is a problem on systems of linear equations in two variables, and this material has been studied previously in class, I have a good understanding of it.
PZ-005	: Okay, but when you were working on this problem, I noticed you seemed confused during the first five minutes. I would like to know what made you feel confused.
SM-006	: Well, at first I thought I had to find the price of one package A and one package B. So, in the beginning, I understood X and Y as package A and package B. I only understood it correctly after you gave me an explanation.

- PZ-007 : Well, I only gave you a brief explanation, and after that I noticed you started working more smoothly on the problem. Were you confident with the steps you used? Could you explain to me what steps you applied here?
- SM-008 : I was confident. At the beginning, there was package 1: $3A + 2B = 39.000$ and package 2: $2A + 5B = 54.000$. I substituted the values of A and B, then used elimination to find the value of Y, which resulted in $Y = 1.472$. After that, I substituted this Y value into package 1: $8X + 9Y = 39.000$ to find X, and obtained $X = 3.187$. Therefore, for question number one, X represents the book priced at 3.187 and Y represents the pen priced at 1.472.

SM showed optimism in solving the problem, even though he initially made a mistake when converting the word problem into mathematical form. This minor error did not reduce his confidence, as demonstrated by his systematic use of the substitution method to obtain the correct equations. This is consistent with Amanah et al. (2025), who found that higher academic self-confidence increases individuals' ability to overcome problem-solving challenges.

2. Subject SM Self-efficacy Belief on the Strength Indicator

The written test results of subject SM on the self-efficacy belief indicator of strength are presented in Figure 2 below.

$$\begin{array}{l} 8x + 9y = 39.000 \quad | \quad 9 \\ 2x + 5y = 54.000 \quad | \quad 8 \\ \hline 72x + 81y = 351.000 \\ 16x + 40y = 432.000 \\ \hline -41y = -81.000 \\ y = \frac{-81.000}{-41} \\ y = 1.972 \end{array}$$

$$\begin{array}{l} 8x + 9y = 39.000 \\ 8x + 13.8 = 39.000 \\ 8x = 39.000 - 13.800 \\ 8x = 25.200 \\ x = \frac{25.200}{8} = 3.150 \end{array}$$

Jawaban:
1) BUKU = 3.187
PULPEN = 1.472

Figure 2. Subject SM Written Responses on the Strength Indicator

During the interview stage, subject SM also provided statements that reflect his self-efficacy belief in terms of strength. These statements are presented in table 3 below.

Table 3. Interview Responses of Subject SM on Self-efficacy Belief in Strength

Dialogue	
PZ-009	: Alright. While working on this problem, were there any parts that you found difficult?
SM-010	: Yes, I did. I found it difficult when performing the division.
PZ-011	: Why do you consider division to be the difficult part?
SM-012	: Because there were decimal numbers with commas, and that made me feel a bit confused when calculating.
PZ-013	: So, when you experienced that difficulty, what did you do?
SM-014	: I just kept trying to calculate it.
PZ-015	: While working on the problem, I did not give you any restrictions you were free to use your notes or a calculator if you wanted. So, during the time you kept calculating, did you use a calculator?

SM-016	: I did not use a calculator; I calculated manually.
PZ-017	: Okay, I also saw that your scratch paper was full. But were you truly confident with the results of your manual calculations?
SM-018	: Yes, I was very confident because I tried several times to make sure I did not miscalculate.
PZ-019	: If I gave you a system of linear equations problem with longer steps, larger numbers, and decimals like the ones you found difficult earlier, would you still work on it or would you give up?
SM-020	: I would try first, just like when I kept working on the difficult division. But I am not yet sure whether the result would be correct or not.
PZ-021	: Alright, that's good it means you are not hesitant to try. Now that you have managed to solve the problem up to number 2, how do you feel?
SM-022	: I felt relieved, especially when I got the result in the division part, because that was the part that took the longest.

SM consistently showed persistence in completing tasks despite difficulties. His commitment and perseverance reflect the strength indicator of self-efficacy belief, aligning with Hadi et al. (2023), who emphasized that self-efficacy influences how individuals think, handle pressure, motivate themselves, and act in solving problems.

3. Subject SM Self-efficacy Belief on the Generality Indicator

The written test results of subject SM on the self-efficacy belief indicator of generality are presented in Figure 3 below.

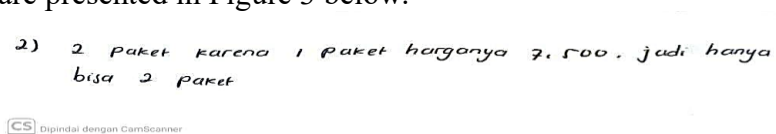


Figure 3. Subject SM Written Responses on the Generality Indicator

During the interview stage, subject SM also provided statements that reflect his self-efficacy belief in terms of generality. These statements are presented in table 4 below.

Table 4. Interview Responses of Subject SM on Self-efficacy Belief in Generality

Dialogue	
PZ-023	: There is a certain satisfaction in calculating manually. Now, if you were faced with a system of linear equations in two variables in the form of simple equations, how confident would you be in solving it?
SM-024	: I am confident I can, because it is easier than the word problem you gave.
PZ-025	: Of course you can, since you were able to solve the word problem, especially one like this. Now, look back at number 2 that you worked on. You answered it directly could you explain how you managed to solve number 2?
SM-026	: For question number 2, package A consists of 2 books and 1 pen. The price of 2 books is 6.400 and the price of 1 pen is 1.472, so the total price of package A is 7.900. Since the student has 20.000, they can only buy 2 packages of A.

PZ-027	: Of course you can, since you were able to solve the word problem, especially one like this. Now, look back at number 2 that you worked on. You answered it directly could you explain how you managed to solve number 2?
SM-028	: Addition, subtraction, multiplication, and division, because this problem requires a lot of such calculations.
PZ-029	: So, since you already understood the basic arithmetic operations beforehand, it really helped you in solving the problem I gave. Alright then, I think that is clear enough. Thank you for answering all of my questions.
SM-030	: You're welcome

SM demonstrated strong self-efficacy in solving linear equation problems, showing confidence that his prior algebraic skills could be applied effectively. This reflects the generality aspect of self-efficacy, where past mastery experiences enhance belief in tackling new tasks. Consistent with Makhmuuda et al. (2025), mastery experience is the most influential factor in shaping self-efficacy, contributing significantly to SM ability to generalize his mathematical skills across contexts. SM mathematical belief can be concluded as positive and strong. He showed confidence in solving problems of varying difficulty (magnitude), persistence despite obstacles (strength), and the ability to apply prior knowledge to new contexts (generality). This aligns with Rizqullah et al. (2025), who emphasized that students valuing mathematics tend to have strong learning motivation.

Self-Efficacy Belief of Subject SF in Problem Solving

1. Subject SM Self-efficacy Belief on the Magnitude Indicator

The written test results of subject SM on the self-efficacy belief indicator of task difficulty (magnitude) are presented in Figure 4 below.

$$\begin{aligned}
 \text{Paket A} &= 2y + x \\
 \text{Paket B} &= y + 3x \\
 \text{Pupen} &= y \\
 \text{buku} &= x \\
 3(2y + x) + 2(y + 3x) &= 39.000 \\
 2(2y + x) + 5(y + 3x) &= 54.000 \\
 = 6y + 3x + 2y + 6x &= 39.000 \\
 4y + 2x + 5y + 13x &= 54.000 \\
 = 10y + 9x &= 39.000 \\
 = 9y + 17x &= 54.000
 \end{aligned}$$

Figure 4. Subject SF Written Responses on the Magnitude Indicator

During the interview stage, subject SF also provided statements that illustrate his self-efficacy belief in magnitude. These statements are presented in Table 5 below.

Table 5. Interview Responses of Subject SF on Self-efficacy Belief in Magnitude

Dialogue	
PZ-001	: Hello, I have a few questions regarding the written test I gave you. After looking at and understanding these questions, do you think they are difficult or easy? And are you confident that you can answer them?

-
- SF-002 : Hello. After reading the questions, I'm confident that I can answer them, but I do feel that they are quite difficult.
- PZ-003 : Why do you think it is difficult?
- SF-004 : Because it is a word problem.
- PZ-005 : Have you previously solved mathematics questions presented as word problems?
- SF-006 : Yes, I have. That's why, even though the questions are quite difficult, I'm still confident that I can solve them.
- PZ-007 : So, your confidence comes from having solved word problems before?
- SF-008 : Yes, I have, and since the material on systems of linear equations in two variables has already been covered in class, I feel prepared to work on it.
- PZ-009 : Alright, but at the beginning, I observed that you appeared somewhat confused while attempting the problems. Could you explain the reason behind that?
- SF-010 : Initially, I had a misunderstanding similar to SM. I assumed that package A corresponded to the variable X and package B to the variable Y. Consequently, my calculations took longer because I was focused on determining the prices of package A and package B at the start.
- PZ-011 : This was the reason I found it unexpected that both of you initially substituted package A and package B as variables, whereas the task required determining the price of one book and one pen. Therefore, I provided a brief explanation of the solution process. Following my explanation, do you now feel confident in the steps you are taking to solve the problem?
- SF-012 : Following your explanation, I feel assured and have gained a clear understanding of the solution process.
- PZ-013 : So, please explain your solution. From the beginning, what did you do first until you arrived at this result?
- SF-014 : Initially, I defined pen as the variable Y and book as the variable X. The problem stated that 3 package A plus 2 package B cost 39.000, while 2 package A plus 5 package B cost 54.000. I substituted the equations representing package A and package B, and through elimination I obtained $Y = 1.472.727$. Subsequently, I substituted this value of Y into the first equation, which yielded $X = -3.218.182$.
-

From the written test and interview, SF demonstrated optimism in facing the problems under the self-efficacy belief indicator of difficulty level (Magnitude). Although he initially made errors in translating the word problem into mathematical form and showed inconsistency in variable use, his persistence reflected confidence in his chosen steps. As Purwasih et al. (2023) note, students with strong self-belief tend to be more persistent and active in learning. Thus, SF perceived the task as a challenge he could overcome, despite minor issues with accuracy and consistency.

2. Subject SF Self-efficacy Belief on the Strength Indicator

The written test results of subject SF on the self-efficacy belief indicator of strength are presented in Figure 5 below.

eliminasi: x

$$\begin{array}{r} 8x + 9y = 39.000 \\ 9x + 17y = 54.000 \end{array} \quad \begin{array}{r} \times 9 = 72x + 81y = 351.000 \\ \times 8 = 72x + 136y = 432.000 \\ \hline -55y = 81.000 \\ y = \frac{81.000}{-55} \\ y = 1.472,727 \end{array}$$

Substitusi: $y = 1.472,72$ ke Persamaan 1

$$\begin{array}{r} 8x + 9y = 39.000 \\ 8x + 9(1.472,727) = 39.000 \\ 8x + 13.254,543 = 39.000 \\ 8x = 13.254,543 - 39.000 \\ 8x = -25.745,457 \\ x = \frac{-25.745,457}{8} \\ x = -3.218,182 \end{array}$$

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Figure 5. Subject SF Written Responses on the Strength Indicator

During the interview stage, subject SF also provided statements that reflect his self-efficacy belief in terms of strength. These statements are presented in table 6 below.

Table 6. Interview Responses of Subject SF on Self-efficacy Belief in Strength

Dialogue	
PZ-015	: Here you made a small mistake. You obtained a negative value for X, but since we are discussing the price of goods, it doesn't make sense to have a negative price. Your error started when calculating $13.254.543 - 39.000$, whereas it should have been $39.000 - 13.254.543$. That's why the result came out negative. It's okay, let's move on. From all the steps you used, which part did you find the most difficult elimination, substitution, or the calculations themselves?
SF-016	: The most challenging aspect was the computation, particularly due to the presence of decimal numbers.
PZ-017	: What strategies did you employ when you encountered difficulties in performing the calculations?
SF-018	: Fortunately, since the use of a calculator was permitted, I relied on it to carry out the calculations.
PZ-019	: Yes, I did not forbid the use of a calculator, but what was your reason for using it? Is it because you are not yet fluent in calculating manually?
SF-020	: Actually, I can calculate manually, but I was worried about making mistakes and spending too much time. So I preferred to use the calculator to avoid errors.
PZ-021	: So, does that mean you are not confident in your manual calculations?
SF-022	: Yes, I am not confident.
PZ-023	: If I give you a word problem on systems of linear equations in two variables that requires a longer solution than this one, and the calculations involve decimals like the ones you found difficult earlier, but with the rule that calculators are not allowed, would you still attempt to solve it or would you give up?
SF-024	: I would still try to solve it, but it might take me longer because I would have to calculate manually and also double-check to make sure the calculations are correct.
PZ-025	: Good, that means you do not give up easily, even though you know it will take more time to complete. Now, since you managed to work up to question number 2, how did you feel?
SF-026	: I felt satisfied because I was able to solve something that initially confused me.

Based on the written test and interview with subject SF regarding the self-efficacy belief indicator in the dimension of Strength, SF showed relatively low confidence when facing tasks involving decimal division. This was evident from the tendency to use a calculator due to doubts about manual accuracy and to speed up problem-solving. According to Bandura, A (1997) theory, strength reflects the ability to maintain confidence when encountering difficulties. SF doubts indicate that this aspect has not yet fully developed, especially in tasks requiring precision. However, despite low confidence, SF did not give up and demonstrated commitment by completing the problems, which also reflects the strength indicator.

3. Subject SF Self-efficacy Belief on the Generality Indicator

The written test results of subject SF on the self-efficacy belief indicator of Generality are presented in Figure 6 below.

2) Paket A = $2y + 1x$
 $= 2(1.472,72) + (3.210,10)$
 $= 2.945,44 + 3.210,10$
 $= 6.163,62$

Paket A yang bisa dia beli adalah 3 paket A dikarenakan 1 paket A = 6.163,62 dikalikan dengan 3 yang menghasilkan 18.490,86 dan mendapatkan kembalian 1.509,14.

Figure 6. Subject SF Written Responses on the Generality Indicator

During the interview stage, subject SF also provided statements that reflect his self-efficacy belief in terms of generality. These statements are presented in table 7 below.

Table 7. Interview Responses of Subject SF on Self-efficacy Belief in Generality

Dialogue	
PZ-027	: If you give me a system of linear equations in two variables in the form of simple equations, I feel confident in solving it?
SF-028	: I'm confident I can solve it, because it's easier. With word problems, sometimes the meaning can be confusing, but with simple equations like this, we can immediately see what to do.
PZ-029	: Of course, compared to word problems, those kinds of questions are much easier. Looking back at number 2 that you worked on, are you really confident with your result?
SF-030	: I'm confident with my answer, because the question asked how many package A items can be bought with 20.000. First, I calculated the price of one package A, which was 6.163.62. With that price, you can buy 3 packages A, since 6.163.62 multiplied by 3 equals 18.490.86. That means you would still have 1.509.14 left as change.
PZ-031	: But take a look again at how you wrote the equation for package A at the beginning. Compare it with your current writing. It should be package A = $2x + y$, whereas you wrote it as $2y + x$. Because of that, the result automatically turned out wrong. But that's okay next time just be more careful and make sure to check before submitting.
SF-032	: Yes, I was in a hurry so I didn't have time to check it again.

PZ-033	: Okay, the next question: in your opinion, which mathematical material or concept that you studied previously helped you in solving this system of linear equations in two variables problem?
SF-034	: Algebra, because in algebra we were already taught about like terms. In, there are many uses of variables, so it's no longer confusing to calculate since we know we have to combine like terms first, such as X with X or Y with Y, before solving.
PZ-035	: Okay, so you already understand that before adding, we need to group terms based on their variables, and that has already been taught in algebra. Alright then, I think everything is clear enough. Thank you for answering all of my questions.
SF-036	: Yes, you're welcome.

From the written test and interview, SF showed a good level of generality in self-efficacy belief. SF was able to apply the concept of Systems of Linear Equations in Two Variables learned earlier to different contexts, although the final answer was not fully correct. SF also displayed strong confidence when facing simple systems of linear equations in two variables equations, supported by prior learning in Algebra, which helped in combining like terms. This reflects Bandura's theory (1997) that mastery experience is the main source of self-efficacy, and is consistent with Makhmuuda et al. (2025), who found mastery experience to be the most dominant factor, contributing 79.5%. Thus, SF confidence can transfer to new situations, though procedural accuracy still needs improvement.

Based on the three dimensions of self-efficacy, SF mathematical belief can be categorized as fairly positive and developing. In magnitude, SF shows optimism and willingness to face challenges, though errors in representation and accuracy remain. In strength, confidence is not yet fully solid, especially with complex calculations, but SF persists in completing tasks. In generality, SF can transfer prior knowledge to new contexts, though procedural accuracy is still limited. This aligns with Mukarromah et al. (2024), who found that students with moderate mathematical belief tend to have adequate problem-solving ability. Thus, SF's mathematical belief provides a good foundation, but consistency, resilience, and accuracy still need reinforcement for optimal results.

The Mathematical Beliefs of Students SM and SF in Solving Systems of Linear Equations in Two Variables

The analysis shows that both subjects, SM and SF, have positive beliefs when solving problems on systems of linear equations in two variables, but with different characteristics. SM is more consistent in his confidence, remains optimistic even though he initially misunderstood the problem, and demonstrates strong perseverance by calculating manually and repeatedly checking his results. Meanwhile, SF is also optimistic, but his confidence is more moderate. He tends to need additional explanations to ensure the steps he takes, and relies more on a calculator because he is less confident in manual calculations. In terms of procedural accuracy, SM is able to systematically apply previous experiences to obtain correct answers, while SF is less careful and sometimes makes mistakes, such as producing negative prices due to calculation errors.

Overall, SM mathematical belief can be categorized as strong and stable, as he shows high confidence, perseverance in facing difficulties, and consistency in applying mathematical procedures. In contrast, SF mathematical belief is relatively positive but still fluctuating, marked by optimism and effort to solve problems, yet not fully consistent in accuracy and procedural correctness. These differences indicate that gender tendencies influence students' mathematical beliefs: students with masculine tendencies emphasize independent effort and procedural consistency, while students with feminine tendencies need more external support and reinforcement in procedural accuracy. This finding is in line with Bandura's theory of magnitude, strength, and generality, and supports Ernest's view that mathematical belief is shaped by psychological, social, and experiential factors within students.

4. Conclusion

The conclusion of this study emphasizes that the mathematical belief of students at SMP Negeri 1 Palu in solving systems of linear equations in two variables is shaped by prior learning experiences and reflected in the three dimensions of self-efficacy: magnitude, strength, and generality. The key findings reveal differences in mathematical belief based on gender tendencies. Students with a masculine gender tendency (SM) demonstrated strong and positive beliefs, characterized by the ability to tackle difficult problems, persistence in completing tasks, and the capacity to transfer prior knowledge into new contexts. In contrast, students with a feminine gender tendency (SF) showed moderately positive beliefs that are still developing. SF displayed optimism and commitment but requires further reinforcement in consistency, resilience of belief, and procedural accuracy.

This research successfully achieved its objective of describing the mathematical belief profiles of State Junior High School 1 Palu students in solving systems of linear equations in two variables problems, viewed from masculine and feminine gender tendencies. The findings contribute to a deeper understanding of how mathematical beliefs differ according to gender and their implications for mathematics teaching strategies in schools. The strength of this study lies in mapping these differences and highlighting areas that need improvement. For future work, teaching strategies that focus on strengthening resilience, consistency, and procedural accuracy should be developed so that students, regardless of gender tendency, can achieve optimal mathematical beliefs aligned with effective problem-solving outcomes.

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References

- Alifa, I., & Dewi, N. R. (2023). Kajian Teori: Kemampuan Pemecahan Masalah Matematis Peserta Didik ditinjau dari Self-Efficacy pada Model Pembelajaran Preprospec berbantuan TIK. *Prisma, Prosiding Seminar Nasional Matematika*, 6, 314–318. Retrieved from <https://journal.unnes.ac.id/sju/index.php/prisma/article/view/66929/23908>
- Amanah, U. L., Akhyar, M. K., & Dewi, A. F. (2025). Pengaruh Self-Efficacy terhadap Kemampuan Pemecahan Masalah dengan Resiliensi Matematis sebagai Variabel Intervening. *Jurnal Pendidikan Matematika Unpatti*, 6(3), 169–177. <https://doi.org/10.30598/jpmunpatti.v6.i3.p169-177>
- Aprilia, A., & Fitriana, D. N. (2022). Mindset Awal Siswa terhadap Pembelajaran Matematika yang Sulit dan Menakutkan. *Journal Elementary Education*, 1(2), 28–40.
- Awofala, A. O., Lawani, A. O., & Adeyemi, O. A. (2020). Motivation to Learning Mathematics and Gender as Correlates of Senior Secondary School Students' Performance in Mathematics. *Journal of Educational Sciences*, 4(2), 318–333. <https://doi.org/10.31258/jes.4.2.p.318-333>
- Bandura, A. (1997). *Self-Efficacy: The Exercise of Control*. New York: W.H. Freeman and Company.
- Barani, S. B. A., Sugita, G., Anggraini, A., & Idris, M. (2026). Students' Self-Efficacy Profiles in Solving Algebraic Form Problems in Class VII An-Najah SMP IT Al-Fahmi Palu Based on Mathematical Ability. *Journal of Educational Sciences*, 10(2), 3239–3256. <https://doi.org/10.31258/jes.10.2.p.3239-3256>
- Bem, S. L. (1974). The Measurement of Psychological Androgyny. *Journal of Consulting and Clinical Psychology*, 42(2), 155. <https://doi.org/10.1037/h0036215>
- Fauziah, A. N., Yurniwati, Y., & Lestari, I. (2024). Mathematical Belief: Pengaruh Sikap Keyakinan Siswa pada Matematika terhadap Ketercapaian Pembelajaran. In *Edumatnesia: Prosiding Seminar Nasional Matematika dan Pendidikan Matematika* (Vol. 1, No. 1, pp. 44–53). Retrieved from <https://seminar.ustjogja.ac.id/index.php/edumatnesia/article/view/2017>
- Fitriyani. (2024). Analisis Keyakinan Matematika Siswa Kelas VII dalam Menyelesaikan Soal Pemecahan Masalah Materi Aritmetika Sosial. *Jurnal Pendidikan Matematika*, 15(1), 37–48.
- Hadi, F. A., Azmi, S., & Tyaningsih, R. Y. (2025). Hubungan Self-Efficacy dengan Kemampuan Pemecahan Masalah Matematika Siswa Kelas VII SMPN 8 Mataram. *Journal of Authentic Research*, 4(1). <https://doi.org/10.36312/jar.v4i1.3196>
- Makhmuuda, K., & Afrida, Y. (2025). Pengaruh Mastery Experience dan Verbal Persuasion terhadap Self-Efficacy Peserta Didik di MTsN 10 Agam. *Advice: Jurnal Bimbingan dan Konseling*, 7(2), 83–91. Retrieved from <https://journal.univetbantara.ac.id/index.php/advice/article/view/7378/378>

-
- Muhtarom, Sutrisno, Nizaruddin, & Murtianto, Y. H. (2024). Research on Mathematical Beliefs: Systematic Literature Review. *International Journal of Evaluation and Research in Education*, 13(2), 693–704. <https://doi.org/10.11591/ijere.v13i2.25968>
- Mukarromah, S., Rahmawati, N. D., Ariyanto, L., & Al Ashari, S. R. (2024). Kemampuan Pemecahan Masalah Matematis ditinjau dari Belief in Mathematics Siswa dalam Menyelesaikan Soal Turunan Fungsi. *Jurnal Pendidikan dan Pembelajaran Indonesia (JPPI)*, 4(2), 733–745. <https://doi.org/10.53299/jppi.v4i2.539>
- National Council of Teachers of Mathematics (NCTM). (2000). *Principles and Standards for School Mathematics*. Reston, VA: National Council of Teachers of Mathematics.
- Pracilia, A., Fadhilaturrahmi, F., Surya, Y. F., Marta, R., & Rizal, M. S. (2023). Analisis kemampuan belief matematika di sekolah dasar yang menerapkan Kurikulum Merdeka. *el-Ibtidaiy: Journal of Primary Education*, 6(2), 200–208. <http://ejournal.uinsuska.ac.id/index.php/elibtidaiy/article/view/25078/10063>
- Purwasih, E. (2025). Peran Self-Efficacy dalam Meningkatkan Ketekunan Belajar Siswa di Sekolah Dasar. *Jurnal Pendidikan dan Penelitian Serumpun Mengajar*, 2(2), 147–149. Retrieved from <https://jurnal.pgdsdm.id/index.php/sm/article/view/164>
- Rianti, R., Saragih, S., & Zulkarnain, Z. (2020). Development of Mathematics Learning Tools in the Context of Riau Malay Culture to Improve Students' Mathematical Problem-Solving Ability. *Journal of Educational Sciences*, 4(2), 73–82. <https://doi.org/10.31258/jes.9.3.p.1619-1625>
- Rizqullah, N., Syamsuri, & Mutaqin, A. (2025). The Effect of Mathematical Belief, Self-Regulated Learning, and Self-Efficacy on Secondary School Students' Mathematics Learning Achievement. *Communications in Humanities and Social Sciences*, 5(1), 15–23. <https://doi.org/10.21924/chss.5.1.2025.76>
- Sakinah, L. Y., Kartiko, S., & Nas, S. (2018). The Effect Analysis of Self-Attitude and Efficacy on Entrepreneurship Intention of Economics Education Students, Universitas Riau. *Journal of Educational Sciences*, 3(3), 318–327. <https://doi.org/10.31258/jes.3.3.p.318-327>
- Bem, S. L. (1974). The Measurement of Psychological Androgyny. *Journal of Consulting and Clinical Psychology*, 42(2), 155–162. <https://doi.org/10.1037/h0036215>
- Saputra, A. (2019). Application of Cooperative Learning Models of Think Pair Share Type to Improve Student Mathematics Learning Outcomes. *Journal of Educational Sciences*, 3(2), 237–248. <https://doi.org/10.31258/jes.3.2.p.237-248>
- Siswono, T. Y. (2005). Upaya Meningkatkan Kemampuan Berpikir Kreatif Siswa Melalui Pengajuan Masalah. *Jurnal Pendidikan Matematika dan Sains*, 10(1), 1–9.
- Sujadi, J. A., & Azizah, D. (2024). Pengaruh Mathematical Beliefs Terhadap Kemampuan Pemahaman Konsep Matematika Siswa SMA. *Prosiding Konferensi Ilmiah Pendidikan*, 5, 384–389.
- Tunnajach, N. F. (2021). Analisis Kemampuan Pemecahan Masalah Matematis
-

Siswa dalam Menyelesaikan Soal Berbasis Kontekstual pada Materi Trigonometri ditinjau dari Perbedaan Gender. *MATH LOCUS: Jurnal Riset dan Inovasi Pendidikan Matematika*, 2(1), 7–14. <https://doi.org/10.31002/mathlocus.v2i1.1467>

Widiani, S., & Pardi, M. H. H. (2024). Pengaruh Belief dan Self-Confidence Terhadap Kemampuan Pemecahan Masalah Matematika. *Alifbata: Jurnal Pendidikan Dasar*, 4(1), 1–17. <https://doi.org/10.51700/alifbata.v4i1.654>

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