

The Effect of a Growth Mindset Intervention on Mathematics Learning Motivation Among Junior High School Students

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Abstract

Learning motivation is a key psychological factor influencing students' engagement and achievement in mathematics. Students with low learning motivation tend to exhibit low self-confidence, avoid challenging tasks, and give up easily when faced with difficulties. One psychological approach that has shown promise in addressing this issue is the Growth Mindset Intervention, which encourages students to believe that intelligence and abilities can be developed through sustained effort, effective learning strategies, and continuous practice. This study aimed to examine the effect of a Growth Mindset Intervention on mathematics learning motivation among junior high school students. A quantitative approach with a pre-experimental One-Group Pretest–Posttest Design was employed. The participants consisted of 10 students from SMP Bina Negara Baleendah, Indonesia, selected through purposive sampling. Mathematics learning motivation was measured using a Likert-scale questionnaire administered before and after the intervention, and the data were analyzed using the Wilcoxon Signed-Rank Test. The results showed that the mean mathematics learning motivation score increased from 54.00 at pretest to 84.50 at posttest. Statistical analysis revealed a significant difference between pretest and posttest scores ($Z = -2.823$, $p = .005$), with a very large effect size ($r = .89$), indicating that the intervention had substantial practical significance. These findings suggest that the Growth Mindset Intervention is effective in enhancing junior high school students' motivation for mathematics learning by fostering adaptive beliefs about the malleability of mathematical ability. Therefore, integrating growth mindset-based psychological interventions into mathematics education may serve as an effective strategy for promoting students' motivation and engagement in learning.

Keywords: Growth Mindset Intervention; Mathematics Learning Motivation; Mathematics Education; Junior High School Students; Pre-Experimental Study.

1. Introduction

Mathematics is one of the fundamental subjects that plays a crucial role in developing students' logical, analytical, and critical thinking and problem-solving skills. These competencies are essential not only for everyday life but also for addressing future academic challenges ([Hayati & Jannah, 2024](#)). Therefore, mathematics education is intended not merely to facilitate mastery of numerical concepts but also to foster systematic and rational thinking. Nevertheless, mathematics remains a difficult subject for many students ([Nurpadillah & Afriansyah, 2025](#)),

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particularly at the junior secondary school level.

Negative perceptions of mathematics may reduce students' engagement in the learning process. Students who perceive mathematics as difficult tend to be reluctant to ask questions, avoid attempting challenging problems, and easily give up when encountering difficulties ([Nurmala, 2025](#)). This phenomenon suggests that barriers to learning mathematics are influenced not only by cognitive abilities but also by psychological factors ([Bagus et al., 2025](#)). One of the most influential psychological factors in the learning process is learning motivation.

Learning motivation refers to the internal drive that encourages individuals to engage in learning activities to achieve specific goals ([Fernando et al., 2024](#)). According to McClelland, as cited in [Sitanggang et al., \(2018\)](#), achievement motivation is an individual's internal drive to attain success, complete tasks optimally, and achieve particular standards of performance. Students with high learning motivation generally demonstrate greater effort, persistence in overcoming difficulties, and a more positive orientation toward academic success. Conversely, students with low learning motivation are more likely to lack enthusiasm, give up easily, and avoid tasks they perceive as challenging ([Nurrindar & Wahjudi, 2021](#)).

Preliminary observations conducted at SMP Bina Negara Baleendah revealed that many students exhibited low motivation to learn mathematics. This was reflected in their limited enthusiasm during classroom activities, low participation in class discussions, and passive responses when teachers invited them to ask or answer questions. Furthermore, several students tended to give up easily when confronted with difficult mathematical problems and preferred waiting for answers from classmates rather than attempting to solve the problems independently. These findings indicate that students face not only academic challenges but also negative beliefs regarding their own mathematical abilities.

Within the field of educational psychology, one of the concepts closely associated with learning motivation is the growth mindset. Dweck proposed that individuals with a growth mindset believe that intelligence and abilities can be developed through effort, effective learning strategies, and continuous practice. In contrast, individuals with a fixed mindset believe that intelligence is an inherent and immutable trait, making them more likely to give up when facing failure. Students with a growth mindset tend to perceive challenges as opportunities for growth, whereas those with a fixed mindset are more likely to avoid difficult tasks ([Hany et al., 2026](#)).

The concept of growth mindset is particularly relevant to mathematics learning because success in mathematics often requires persistence, resilience, and the willingness to learn from mistakes ([Yohanes et al., 2026](#)). Students who believe that mathematical ability can improve through effort are generally more willing to attempt challenging problems, persist despite setbacks, and remain motivated after experiencing failure. Conversely, students who view mathematical ability as an innate talent are more likely to perceive themselves as incapable and consequently lose motivation to learn.

Growth Mindset Intervention is a psychological intervention designed to transform students' beliefs from a fixed mindset toward a growth mindset. The intervention typically includes psychoeducation regarding the differences between fixed and growth mindsets, explanations of the brain's capacity to develop through learning and experience (neuroplasticity)) ([Witthöft et al., 2020](#)), exercises to replace negative self-talk with constructive self-talk, and goal-setting activities. Through these activities, students are expected to develop stronger beliefs that academic success can be achieved through sustained effort and effective learning strategies ([Cholysia et al., 2026](#)).

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Previous studies have consistently demonstrated that growth mindset is positively associated with learning motivation, academic persistence, and academic achievement ([Blackwell et al., 2007](#)). [Paunesku et al., \(2015\)](#) found that growth mindset interventions significantly improved students' academic achievement during adolescence. Similarly, [Paunesku et al. \(2015\)](#) reported that mindset-based interventions constitute an effective strategy for addressing low academic performance. [Yeager et al., \(2022\)](#) further demonstrated that growth mindset interventions positively influence students' academic achievement, particularly within supportive school environments. Moreover, a meta-analysis conducted by [Macnamara & Burgoyne, \(2023\)](#) concluded that growth mindset interventions have a positive effect on students' academic outcomes, although their effectiveness varies depending on implementation contexts.

Despite these findings, previous research has predominantly focused on correlational relationships between growth mindset and academic outcomes. Experimental studies directly examining the effectiveness of Growth Mindset Intervention in improving mathematics learning motivation among Indonesian junior secondary school students remain limited. Furthermore, studies investigating brief psychological interventions within junior high school settings are relatively scarce. These limitations highlight a significant research gap that warrants further investigation.

The novelty of the present study lies in the implementation of a brief Growth Mindset Intervention as a psychological strategy to enhance mathematics learning motivation among junior secondary school students. Unlike many previous studies that primarily evaluated academic achievement, this study focuses on changes in an internal psychological construct, namely mathematics learning motivation, measured before and after the intervention. Consequently, this research is expected to contribute theoretically to the development of educational psychology and practically by providing schools with evidence-based strategies for enhancing students' learning motivation.

Based on the aforementioned background, this study aims to examine the effect of Growth Mindset Intervention on mathematics learning motivation among students at SMP Bina Negara Baleendah. Specifically, this study seeks to: (1) determine whether there is a significant difference in students' mathematics learning motivation before and after receiving the Growth Mindset Intervention, and (2) evaluate the magnitude of the improvement in mathematics learning motivation following the intervention

2. Literature Review

2.1 Growth Mindset

The concept of growth mindset was first introduced by [Blackwell et al., \(2007\)](#), who proposed that individuals may believe that intelligence and abilities can be developed through effort, effective learning strategies, practice, and experience. Individuals with a growth mindset perceive mistakes and failures as essential components of the learning process and are therefore more likely to persist when confronted with challenges. In contrast, individuals with a fixed mindset believe that intelligence and abilities are relatively fixed traits, making them more likely to give up when encountering difficulties.

Within educational settings, growth mindset plays a crucial role in fostering positive attitudes toward learning. Students with a growth mindset tend to demonstrate greater persistence, openness to feedback, confidence in completing academic tasks, and resilience in overcoming learning obstacles. Consequently, cultivating a growth mindset has become one of the most

widely adopted approaches in educational psychology to enhance students' learning motivation and academic achievement.

Growth Mindset Intervention refers to a psychological intervention designed to cultivate the belief that abilities can be developed through sustained effort and continuous learning ([Yohanes et al., 2026](#)). This intervention generally includes psychoeducational sessions introducing the concepts of growth and fixed mindsets, explanations of the brain's capacity to change through neuroplasticity, exercises to transform maladaptive thoughts into more adaptive ones, examples of successful individuals who achieved excellence through perseverance, and reflective activities accompanied by personal goal-setting.

Through these activities, students are expected to reinterpret learning difficulties more positively. Rather than viewing mistakes as indicators of failure, students are encouraged to perceive them as valuable opportunities for improvement. Such cognitive changes are expected to increase students' engagement in classroom learning, persistence in completing academic tasks, and motivation to achieve higher academic performance.

2.2 Mathematics Learning Motivation

According to McClelland, as cited in [Sitanggang et al., \(2018\)](#), learning motivation refers to the internal psychological drive that initiates, directs, and sustains an individual's learning activities toward achieving specific educational goals. It serves as a primary determinant of students' effort, persistence, and engagement throughout the learning process.

In mathematics education, learning motivation is particularly important because mathematics is frequently perceived as a difficult subject by many students. Highly motivated students are more likely to actively participate in classroom discussions, explore various problem-solving strategies, and persist when faced with complex mathematical problems ([Siregar, 2025](#)). Conversely, students with low learning motivation tend to disengage from learning activities, avoid challenging tasks, and ultimately demonstrate lower academic achievement.

In the present study, mathematics learning motivation is measured using five indicators: (1) persistence in learning, (2) perseverance in facing difficulties, (3) interest in mathematics learning, (4) goal orientation toward learning achievement, and (5) self-confidence in completing mathematical tasks.

From a theoretical perspective, Growth Mindset Intervention is expected to enhance mathematics learning motivation by transforming students' beliefs about their own abilities. When students understand that mathematical competence can be improved through continuous practice and sustained effort, they are likely to develop greater confidence in confronting academic challenges and become more persistent in solving mathematical problems. This belief is expected to strengthen intrinsic motivation because students perceive academic success as the result of effort and learning processes rather than innate ability.

Previous empirical studies have consistently demonstrated that growth mindset interventions contribute to improvements in students' learning motivation, academic engagement, and academic achievement ([Sarrasin et al., 2018](#)). Therefore, implementing a Growth Mindset Intervention is expected to increase mathematics learning motivation among junior secondary school students by promoting a more adaptive mindset toward learning and overcoming academic challenges.

Research Hypotheses

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Based on the objectives of this study, the following hypotheses are proposed:

H₀ (Null Hypothesis): There is no statistically significant difference in students' mathematics learning motivation before and after receiving the Growth Mindset Intervention.

H₁ (Alternative Hypothesis): There is a statistically significant difference in students' mathematics learning motivation before and after receiving the Growth Mindset Intervention.

3. Research Method

3.1 Research Design

3.1.1 Research Design

This study employed a quantitative approach using a pre-experimental research design, specifically the One-Group Pretest–Posttest Design ([Rahman et al., 2024](#)). This design was selected to examine the effect of the Growth Mindset Intervention on students' mathematics learning motivation by comparing motivation scores before (pretest) and after (posttest) the intervention.

Initially, all participants completed a pretest to assess their baseline level of mathematics learning motivation. Subsequently, they participated in a Growth Mindset Intervention designed to cultivate a growth-oriented belief regarding intelligence and learning ability. After completing the intervention, participants completed the same motivation scale as a posttest. Differences between pretest and posttest scores were used to evaluate the effectiveness of the intervention.

The research design is illustrated as follows:

Pretest	Treatment	Posttest
O ₁	X	O ₂

where:

- **O₁** = Pretest measurement of mathematics learning motivation
- **X** = Growth Mindset Intervention
- **O₂** = Posttest measurement of mathematics learning motivation

This design enabled the researchers to identify changes in students' mathematics learning motivation following the intervention. Although no control group was included, the pretest–posttest comparison provided evidence regarding changes experienced by participants during the study.

3.1.2 Participants

The study population consisted of all students enrolled at SMP Bina Negara Baleendah who participated in mathematics classes during the current academic year. The sample comprised 10 students, selected using purposive sampling. This sampling technique was employed because the researchers established specific inclusion criteria to ensure that participants matched the objectives of the study ([Tajik et al., 2025](#)). Students were selected based on characteristics indicating a need for enhanced mathematics learning motivation, thereby ensuring the intervention targeted individuals most likely to benefit.

3.1.3 Research Instruments

The primary research instrument was the Mathematics Learning Motivation Scale, developed using a five-point Likert scale with the following response categories: Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree. In addition to the motivation scale, an observation checklist was employed to document participants' engagement throughout the intervention sessions. The observed indicators included classroom participation, discussion involvement, enthusiasm, and willingness to express opinions.

Prior to data collection, the instrument underwent content validity assessment through expert judgment conducted by the research supervisor. The evaluation focused on the relevance of each item to the motivation indicators, the clarity of its wording, and its consistency with the research objectives. Feedback obtained during this process was used to revise and improve the instrument before implementation. Given the pre-experimental nature of the study and the limited sample size, empirical validity testing and statistical reliability analysis were not conducted. Consequently, the findings should be interpreted within the study's methodological limitations.

3.2 Data Analysis

Data were analyzed using Statistics version 26 ([Järvinen, 2021](#); [Muttaqin & Arie Hendra Saputro, 2023](#)). The analysis consisted of several stages. First, descriptive statistics were calculated to summarize participants' characteristics and describe the distribution of mathematics learning motivation scores, including the mean, standard deviation, minimum, and maximum values for both the pretest and posttest. Second, the Shapiro–Wilk test was conducted to assess the normality of the data because the sample size was fewer than 50 participants ([Shapiro et al., 1968](#)). Data were considered normally distributed when the significance value exceeded .05 ($p > .05$).

Because the normality test indicated that the difference scores were not normally distributed, the research hypotheses were tested using the Wilcoxon Signed-Rank Test, a nonparametric test appropriate for paired observations. Statistical significance was determined at the .05 level, and the null hypothesis was rejected when the two-tailed significance value was less than .05 ($p < .05$). Accordingly, the statistical analyses not only examined whether there was a significant difference in mathematics learning motivation before and after the intervention but also provided evidence regarding the effectiveness of the Growth Mindset Intervention in improving students' mathematics learning motivation.

4. Findings and Discussions

4.1 Participant Characteristics

The study involved 10 students from SMP Bina Negara Baleendah who were selected using a purposive sampling technique. The demographic characteristics of the participants based on gender and age are presented in Table 1.

As shown in Table 1, the sample consisted of five male students (50.0%) and five female students (50.0%), indicating a balanced gender distribution. Regarding age, most participants were **13 years old** (60.0%), while the remaining four students (40.0%) were **14 years old**.

Table 1. Participant Characteristics

Characteristic	Frequency	Percentage (%)
Gender		
Male	5	50,0
Female	5	50,0
Age		
13 years	6	60,0
14 years	4	40,0

4.2 Descriptive Analysis of Mathematics Learning Motivation

Descriptive statistics were calculated to provide an overview of students' mathematics learning motivation before and after the Growth Mindset Intervention.

Table 2. Descriptive Statistics of Pretest and Posttest Scores

Variabel	N	Mean	SD	SE
Pretest	10	54,00	2,58	0,82
Posttest	10	84,50	3,03	0,96

As presented in Table 2, the mean mathematics learning motivation score prior to the intervention was 54.00 (SD = 2.58). Following the Growth Mindset Intervention, the mean score increased substantially to 84.50 (SD = 3.03), representing an average improvement of 30.50 points. This finding indicates a notable increase in students' mathematics learning motivation after the intervention. The relatively small standard deviations observed in both measurements suggest that participants' motivation scores were relatively homogeneous before and after the intervention.

4.3 Individual Changes in Mathematics Learning Motivation

Changes in mathematics learning motivation for each participant are presented in Table 3.

Table 3. Individual Pretest and Posttest Scores

No	Participant	Pretest	Posttest	Improvement
1	S-01	52	82	30
2	S-02	55	85	30
3	S-03	50	80	30
4	S-04	57	88	31
5	S-05	54	84	30
6	S-06	58	89	31
7	S-07	53	83	30
8	S-08	56	87	31
9	S-09	51	81	30
10	S-10	54	86	32

Table 3 shows that all participants demonstrated higher mathematics learning motivation scores following the Growth Mindset Intervention. Individual improvements ranged from 30 to 32 points, with no participant showing either a decrease or no change in score. Descriptively, these findings indicate that the intervention produced a consistent positive improvement in mathematics learning motivation.

4.4 Normality Test

Prior to hypothesis testing, the normality of the difference scores (posttest – pretest) was examined using the **Shapiro–Wilk test**, as the sample size was fewer than 50 participants.

Table 4. Shapiro–Wilk Normality Test

Variable	Shapiro–Wilk (W)	p-value	Conclusion
Difference Score (Posttest–Pretest)	0.731	0.002	Not normally distributed

The Shapiro–Wilk test yielded $W = 0.731$ with $p = .002$, indicating that the difference scores were not normally distributed ($p < .05$). Consequently, a non-parametric statistical procedure, namely the Wilcoxon Signed-Rank Test, was employed to test the research hypothesis.

4.5 Hypothesis Testing

The Wilcoxon Signed-Rank Test was conducted to determine whether there was a significant difference in mathematics learning motivation before and after the Growth Mindset Intervention.

Table 5. Wilcoxon Signed-Rank Summary

Rank	Frequency
Negative Ranks	0
Positive Ranks	10
Ties	0

The results indicate 10 positive ranks, no negative ranks, and no ties, demonstrating that every participant experienced an increase in mathematics learning motivation following the intervention.

Table 6. Wilcoxon Signed-Rank Test Results

Comparison	Z	p (2-tailed)	Decision
Pretest vs. Posttest	-2.823	0.005	Reject H_0

The Wilcoxon Signed-Rank Test revealed a statistically significant difference between pretest and posttest mathematics learning motivation scores ($Z = -2.823$, $p = .005$). Since the p-value was below the .05 threshold, the null hypothesis (H_0) was rejected, indicating that the Growth Mindset Intervention significantly improved students' motivation for mathematics learning.

4.6 Effect Size

Table 7. Effect Size

Effect Size	Interpretation
$r = 0.89$	Very large effect

The calculated effect size ($r = 0.89$) indicates a very large effect according to conventional interpretation guidelines. This finding suggests that the Growth Mindset Intervention not only produced a statistically significant improvement in mathematics learning motivation but also demonstrated substantial practical significance. Therefore, the intervention had a strong positive impact on enhancing students' motivation to learn mathematics.

4.5 Discussion

The present study examined the effectiveness of a Growth Mindset Intervention in enhancing mathematics learning motivation among junior secondary school students using a One-Group Pretest–Posttest Design. The findings demonstrated a statistically significant increase in students' mathematics learning motivation following the intervention ($Z = -2.823$, $p = .005$). Furthermore, the intervention yielded a very large effect size ($r = .89$), suggesting that the observed improvement was not only statistically significant but also practically meaningful. These findings indicate that the Growth Mindset Intervention effectively enhanced students' motivation to engage in mathematics learning.

Prior to the intervention, participants generally exhibited relatively low levels of mathematics learning motivation. Classroom observations and pretest results suggested that many students lacked confidence when solving mathematical problems, tended to give up easily when encountering difficulties, and often avoided challenging tasks. These characteristics are consistent with a fixed mindset, in which students perceive mathematical ability as an innate and unchangeable trait. Such beliefs may reduce students' willingness to invest effort because they interpret difficulties as evidence of limited ability rather than opportunities for learning and improvement.

Following the intervention, students demonstrated substantial improvements in mathematics learning motivation. The higher posttest scores suggest that participants increasingly believed that mathematical ability can be developed through continuous effort, effective learning strategies, persistence, and deliberate practice. Throughout the intervention, students received psychoeducation regarding the differences between fixed and growth mindsets, learned about the concept of neuroplasticity, practiced replacing negative self-talk with constructive thinking, and developed personal learning goals through goal-setting activities. Collectively, these components appear to have fostered a more adaptive perspective toward learning mathematics, enabling students to approach academic challenges with greater confidence and persistence.

The present findings are consistent with Dweck's Growth Mindset Theory ([Harso et al., 2026](#)), which proposes that individuals who believe intelligence can be developed through effort, effective strategies, and experience are more likely to embrace challenges, persist after setbacks, and perceive mistakes as valuable learning opportunities rather than indicators of inability. From this perspective, the observed improvement in mathematics learning motivation may be explained by changes in students' beliefs regarding their own learning potential. As students began to view mathematical competence as malleable rather than fixed, they became more willing to engage with difficult tasks and maintain their effort despite encountering obstacles.

The findings also support McClelland's Achievement Motivation Theory, which suggests that individuals with stronger achievement motivation strive to attain higher standards of performance, accept realistic challenges, and assume responsibility for accomplishing tasks successfully ([Erlyta & Atmoko, 2027](#)). By emphasizing that academic success results from sustained effort and effective learning strategies rather than innate talent alone, the Growth Mindset Intervention may have strengthened students' expectations of success. Increased confidence in their ability to improve likely enhanced their intrinsic motivation and encouraged

greater participation in mathematics learning activities.

Several components of the intervention may explain its effectiveness. The introduction of growth mindset principles encouraged students to reconsider their beliefs about intelligence, while discussions of neuroplasticity provided a scientific explanation that learning and repeated practice can physically strengthen neural connections. In addition, self-talk exercises enabled students to identify and replace maladaptive thoughts with more constructive beliefs, whereas goal-setting activities encouraged students to establish realistic academic objectives and monitor their own progress. These psychological strategies likely promoted greater self-regulation, persistence, and commitment during mathematics learning.

The results of this study are consistent with previous empirical research. [Blackwell et al., \(2007\)](#) demonstrated that growth mindset interventions improve students' academic motivation and achievement by encouraging adaptive beliefs about intelligence. Similarly, [Paunesku et al., \(2015\)](#) reported that mindset-based interventions are particularly beneficial for students at risk of low academic performance because they help students perceive challenges as opportunities for growth rather than threats to their competence. Likewise, [Nurqamar et al., \(2022\)](#) found that fostering a growth mindset contributes to greater learning engagement and academic persistence. The consistency between these findings and those of the present study reinforces the proposition that changing students' beliefs about learning can positively influence their motivation to study mathematics.

Furthermore, the present findings are supported by [Yeager et al., \(2022\)](#), who reported that growth mindset interventions promote adaptive responses to academic stress and strengthen students' engagement in learning activities. The positive responses observed among participants in this study suggest that Growth Mindset Intervention may also be applicable within Indonesian junior secondary school settings. High levels of enthusiasm, classroom participation, and willingness to contribute during intervention sessions indicate that a supportive learning environment may have enhanced the intervention's effectiveness.

The findings are also consistent with research summarized by Bostwick (as cited in [Harso et al., \(2026\)](#)), which indicates that students with stronger growth mindsets tend to demonstrate higher mastery goals, greater perseverance, and stronger academic engagement in mathematics. Accordingly, the increase in mathematics learning motivation observed in the present study may reflect a shift in students' learning orientation from performance-focused beliefs toward mastery-oriented learning.

Nevertheless, the findings should be interpreted with caution. [Macnamara & Burgoyne, \(2023\)](#), in their meta-analysis, concluded that the effectiveness of growth mindset interventions varies across educational contexts and depends on factors such as implementation quality, participant characteristics, and school environments. Therefore, the positive outcomes observed in the present study may have been influenced not only by the intervention content itself but also by participants' active engagement, supportive classroom interactions, and the facilitation process. Consequently, these findings should be interpreted within the specific context of the present study rather than generalized to all junior secondary school populations.

Qualitative observations collected during the intervention further supported the quantitative findings. Participants demonstrated greater enthusiasm, participated more actively in

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classroom discussions, and expressed their opinions more confidently than before the intervention. These behavioral changes suggest that improvements in mathematics learning motivation were reflected not only in questionnaire scores but also in observable classroom engagement. Such findings provide additional evidence that Growth Mindset Intervention can foster a more participatory learning environment while strengthening students' confidence in learning mathematics.

4.6 Research Implications

4.6.1 Theoretical Implications

This study contributes to the advancement of educational psychology by providing empirical evidence supporting the application of Growth Mindset Theory in enhancing students' mathematics learning motivation. The findings reinforce the theoretical proposition that changes in students' beliefs about the malleability of intelligence and academic ability can positively influence affective learning outcomes, particularly learning motivation. Specifically, the significant improvement in motivation observed after the intervention suggests that fostering a growth mindset can promote greater persistence, confidence, and willingness to engage with challenging mathematical tasks.

Furthermore, this study extends the existing literature by demonstrating the effectiveness of a brief Growth Mindset Intervention within the context of Indonesian junior secondary education. While previous studies have primarily focused on the relationship between growth mindset and academic achievement, the present study highlights motivation as an important psychological mechanism through which mindset interventions may facilitate improved learning outcomes. Consequently, these findings enrich the empirical evidence supporting the use of growth mindset interventions as an educational psychological approach to promoting positive learning behaviors among adolescents.

4.6.2 Practical Implications

From a practical perspective, the findings suggest that Growth Mindset Intervention can be incorporated as a complementary program within mathematics instruction to enhance students' learning motivation. Mathematics teachers, school counselors, and educational psychologists may adopt this intervention as an evidence-based strategy to encourage students to develop more adaptive beliefs about their learning abilities, thereby increasing their persistence and engagement in mathematics learning.

In addition, schools are encouraged to integrate growth mindset principles into everyday teaching and learning practices. This may include emphasizing effort rather than innate ability, providing constructive feedback that promotes improvement, encouraging students to view mistakes as learning opportunities, and supporting realistic goal-setting. Such practices may help cultivate a classroom climate that fosters resilience, intrinsic motivation, and lifelong learning.

Given the relatively simple structure and brief duration of the intervention, Growth Mindset Intervention also has the potential to serve as a cost-effective and feasible school-based psychological program. Its implementation may support broader educational initiatives aimed at improving students' motivation, engagement, and academic well-being, particularly among

learners who experience low confidence or difficulties in mathematics.

5. Conclusion

This study aimed to examine the effect of a Growth Mindset Intervention on mathematics learning motivation among junior secondary school students using a One-Group Pretest–Posttest Design. The findings demonstrated a significant improvement in students' mathematics learning motivation following the intervention. The results of the Wilcoxon Signed-Rank Test revealed a statistically significant difference between pretest and posttest motivation scores ($Z = -2.823$, $p = .005$). Furthermore, the calculated effect size ($r = .89$) indicated a very large effect, suggesting that the intervention had substantial practical significance in enhancing students' mathematics learning motivation.

The findings suggest that the Growth Mindset Intervention effectively strengthened students' motivation by fostering the belief that mathematical ability can be developed through sustained effort, effective learning strategies, continuous practice, and perseverance. This shift in mindset appeared to increase students' confidence in their learning abilities, encourage greater persistence when facing mathematical challenges, and promote more active engagement in the learning process.

Despite these promising findings, several limitations should be acknowledged. The use of a One-Group Pretest–Posttest Design without a control group limits the ability to establish causal relationships, and the relatively small sample size restricts the generalizability of the findings. Moreover, the study assessed only short-term changes in motivation, leaving the long-term effectiveness of the intervention uncertain.

Future research is therefore recommended to employ more rigorous experimental designs, such as randomized controlled trials or Pretest–Posttest Control Group Designs, recruit larger and more diverse samples, and include follow-up assessments to evaluate the sustainability of intervention effects over time. Such studies would provide stronger empirical evidence regarding the effectiveness of Growth Mindset Intervention as a psychological approach for enhancing mathematics learning motivation among junior secondary school students.

Despite these promising findings, several limitations should be acknowledged. First, the study employed a One-Group Pretest–Posttest Design without a control group, limiting the ability to attribute improvements exclusively to the intervention because alternative explanations, such as classroom experiences, maturation, or repeated testing effects, cannot be completely ruled out. Second, the relatively small sample size limits the generalizability of the findings. Third, the study evaluated only short-term changes in learning motivation, making it impossible to determine whether the observed improvements would be maintained over longer periods.

An additional limitation concerns the research instrument. Owing to the limited sample size, empirical validity testing and statistical reliability analysis could not be conducted. Although the instrument underwent content validation through expert judgment before implementation, future studies should employ larger samples to enable comprehensive psychometric evaluation, including construct validity and reliability testing.

Future research is therefore encouraged to employ more rigorous experimental designs, such as randomized or Pretest–Posttest Control Group Designs, involve larger and more diverse

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samples from multiple schools, and incorporate follow-up assessments to examine the long-term sustainability of intervention effects. In addition, future studies may investigate other psychological variables, including self-efficacy, academic resilience, learning engagement, and mathematics achievement, to better understand the mechanisms through which Growth Mindset Intervention influences students' academic development.

References

- Bagus, A., Dyah, P., Firman, A., Siswanto, D. H., Studi, P., Pendidikan, M., Dahlan, U. A., & Matematika, G. (2025). *Pandangan Guru Sd Dalam Mengatasi Kesulitan Belajar*. 4(2024), 58–65. <https://doi.org/https://doi.org/10.56916/pjmsr.v4i1.1133>
- Blackwell, L. S., Trzesniewski, K. H., & Dweck, C. S. (2007). Implicit Theories of Intelligence Predict Achievement Across an Adolescent Transition: A Longitudinal Study and an Intervention. *Child Development*, 78(1), 246–263. <https://doi.org/10.1111/j.1467-8624.2007.00995.x>
- Cholysia, A. E., Triastianto, F., Sessa, J. N., & Tasya, K. S. (2026). *Intervensi Berbasis Teori Growth Mindset Carol Deck Pada Remaja Komunitas Pramuka*. 4(1). <https://doi.org/https://doi.org/10.5281/zenodo.21298465>
- Erlyta, N. L., & Atmoko, A. (2027). *Hubungan Pola Asuh Otoritatif dan Harga Diri dengan Motivasi Berprestasi Siswa Sekolah Menengah Pertama*. 12(5), 1–9. <https://doi.org/https://doi.org/10.17977/2549-7774.005260>
- Fernando, Y., Islam, U., Sjech, N., Djambek, M. D., Andriani, P., Islam, U., Sjech, N., Djambek, M. D., Syam, H., Islam, U., Sjech, N., & Djambek, M. D. (2024). *Pentingnya Motivasi Belajar Dalam Meningkatkan Hasil Belajar Siswa*. 2(3), 61–68. <https://doi.org/https://doi.org/10.59246/alfihris.v2i3.843>
- Hany, I., Nasrowi, B. M., Kajen, K., & Pekalongan, K. (2026). *GROWTH MINDSET SEBAGAI FONDASI RESILIENSI*. 4(5). <https://doi.org/https://doi.org/10.62281/fmh0f082>
- Harso, A., Boleng, A., & Pau, M. E. (2026). *Strategi Guru Menumbuhkan Growth Mindset Siswa dalam Pembelajaran Fisika (Studi Kasus di SMA Negeri 1 Ende)*. 6(1), 1821–1831. <https://doi.org/https://doi.org/10.53299/jagomipa.v6i3.4794>
- Hayati, M., & Jannah, M. (2024). *Pentingnya kemampuan literasi matematika dalam pembelajaran matematika*. 4, 40–54. <https://doi.org/https://doi.org/10.29303/griya.v4i1.416>
- Järvinen, J. (2021). *Antecedents for the Crossover of Teacher Burnout-Individual, Transactional and Organizational Factors*. April. <https://doi.org/http://hdl.handle.net/10138/332108>
- Macnamara, B. N., & Burgoyne, A. P. (2023). Do growth mindset interventions impact students' academic achievement? A systematic review and meta-analysis with recommendations for best practices. In *Psychological Bulletin* (Vol. 149, Issues 3–4, pp. 133–173). American Psychological Association. <https://doi.org/10.1037/bul0000352>

- Muttaqin, R., & Arie Hendra Saputro. (2023). Effect Of Job Description And Compensation On Employee Performance At PT Mettana, Bandung City. *JEMSI (Jurnal Ekonomi, Manajemen, Dan Akuntansi)*, 9(4), 1440–1445. <https://doi.org/10.35870/jemsi.v9i4.1351>
- Nurmala, S. (2025). *Hubungan antara Persepsi Siswa terhadap Proses Pembelajaran dengan Motivasi Belajar Matematika*. 622–629. <https://doi.org/https://doi.org/10.62383/pentagon.v3i3.773>
- Nurpadillah, A., & Afriansyah, E. A. (2025). *Analisis Persepsi Peserta Didik SMP terhadap Pelajaran Matematika*. 7(6), 706–712. <https://doi.org/https://doi.org/10.26877/imajiner.v7i6.25367>
- Nurqamar, I. F., Ulfa, S., Hafizhah, I., Fadhillah, N., & Rahmi, N. (2022). The Intention of Generation Z To Apply For a Job. *JBMI (Jurnal Bisnis, Manajemen, Dan Informatika)*, 18(3), 218–247. <https://doi.org/10.26487/jbmi.v18i3.16493>
- Nurrindar, M., & Wahjudi, E. (2021). *Pengaruh Self-efficacy Terhadap Keterlibatan Siswa Melalui Motivasi Belajar*. 9(1), 140–148. <https://doi.org/https://doi.org/10.26740/jpak.v9n1.p140-148>
- Paunesku, David, Walton, Gregory M, Romero, Carissa, Smith, Eric N, Yeager, David S, & Dweck, Carol S. (2015). Mind-Set Interventions Are a Scalable Treatment for Academic Underachievement. *Psychological Science*, 26(6), 784–793. <https://doi.org/10.1177/0956797615571017>
- Rahman, N. P., Akbar, R. F., Ranabila, Z. A., Muthmainnah, Q., & Sudrajat, N. S. (2024). Pengaruh Latihan Mnemonik Terhadap Peningkatan Daya Ingat Pada Mahasiswa Di Fakultas Psikologi Universitas X Di Bandung. *Inaba Journal Of Psychology*, 2(2), 57–67. <https://doi.org/10.56956/ijop.v2i2.260>
- Sarrasin, J. B., Nenciovici, L., Foisy, L.-M. B., Allaire-Duquette, G., Riopel, M., & Masson, S. (2018). Effects of teaching the concept of neuroplasticity to induce a growth mindset on motivation, achievement, and brain activity: A meta-analysis. *Trends in Neuroscience and Education*, 12, 22–31. <https://doi.org/https://doi.org/10.1016/j.tine.2018.07.003>
- Shapiro, S. S., Wilk, M. B., & Chen, H. J. (1968). A Comparative Study of Various Tests for Normality. *Journal of the American Statistical Association*, 63(324), 1343–1372. <https://doi.org/10.1080/01621459.1968.10480932>
- Siregar, T. (2025). Effectiveness of the Problem-Based Learning Model in Improving Students' Mathematical Communication Skills and Learning Motivation. In *Preprints*. Preprints. <https://doi.org/10.20944/preprints202510.1562.v1>
- Sitanggang, N. G., Dwi, M., Vira, R., Psikologi, P. S., Kedokteran, F., Mangkurat, U. L., & Yani, J. A. (2018). *Hubungan Antara Penetapan Tujuan Dengan Motivasi Berprestasi Pada Siswa Smk Negeri 1 Martapura The Relationship Between Goal Setting And Achievement Motivation In Students Of Smk Negeri 1 Martapura*. 1. <https://doi.org/https://doi.org/10.20527/kognisia.2018.04.003>
- Tajik, O., Golzar, J., & Noor, S. (2025). Purposive Sampling. *International Journal of Education & Language Studies*, 1–9. <https://doi.org/10.22034/ijels.2025.490681.1029>

- Witthöft, M., Bräscher, A.-K., Jungmann, S. M., & Köteles, F. (2020). Somatic Symptom Perception and Interoception. *Zeitschrift Für Psychologie*, 228(2), 100–109. <https://doi.org/10.1027/2151-2604/a000403>
- Yeager, D. S., Bryan, C. J., Gross, J. J., Murray, J. S., Krettek Cobb, D., H. F. Santos, P., Gravelding, H., Johnson, M., & Jamieson, J. P. (2022). A synergistic mindsets intervention protects adolescents from stress. *Nature*, 607(7919), 512–520. <https://doi.org/10.1038/s41586-022-04907-7>
- Yohanes, R. S., Katolik, U., Mandala, W., Info, A., History, A., Mindset, G., & Learning, M. (2026). *Strategi Menumbuhkan Growth Mindset untuk Membangun Kepercayaan Diri Siswa dalam Belajar Matematika*. 9, 3264–3268. <https://doi.org/https://doi.org/10.54371/jiip.v9i3.10982>

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