

Effectivity of Growth Mindset-Based Learning on Elementary School Students' Achievement Motivation

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Abstract: Fostering achievement motivation in elementary school students is critical to sustaining long-term academic engagement and resilience. While traditional educational practices often inadvertently reinforce a fixed mindset through rigid performance metrics, empirical research evaluating the structural impact of growth mindset-based interventions on young learners' intrinsic drive to achieve remains underrepresented. This study aims to examine the effect of growth mindset-based learning on elementary school students' achievement motivation. Employing a quantitative quasi-experimental design, this study involved 60 sixth-grade students, systematically assigned into an experimental class ($n = 30$, receiving growth mindset-based learning) and a control class ($n = 30$, receiving conventional instruction). Data on achievement motivation were gathered via a validated questionnaire and analyzed using descriptive statistical metrics alongside paired and independent sample t-tests. The empirical findings indicate that growth mindset-based learning exerts a highly positive and statistically significant effect on students' achievement motivation. The experimental group exhibited a substantial increase in mean motivation scores, rising from a pre-treatment baseline of 67.35 (low category) to an impressive 91.08 (very high category) post-treatment. In contrast, the control group's post-test mean stagnated at 65.19 (low category), establishing the definitive pedagogical superiority of the growth mindset framework ($p < 0.05$). Consequently, growth mindset-based learning serves as a potent pedagogical alternative to overcome low achievement motivation in primary education. Beyond immediate psychological gains, these insights offer a scalable framework for curriculum designers to embed psychological resilience and effort-oriented praise into elementary instructional methodologies.

Keywords: Growth Mindset, Achievement Motivation, Elementary Education, Quasi-Experimental, Educational Psychology.

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INTRODUCTION

Achievement motivation has long been recognized as one of the most important psychological factors influencing students' academic success. In elementary education, achievement motivation plays a critical role because it shapes students' willingness to engage in learning activities, persist when encountering difficulties, and strive toward academic excellence. Students with high levels of achievement motivation tend to demonstrate greater perseverance, stronger learning engagement, and better academic outcomes than those with low motivation (Schunk & DiBenedetto, 2020). Consequently, enhancing achievement motivation has become a central concern for educators, researchers, and policymakers seeking to improve educational quality and student performance.

The significance of achievement motivation is particularly evident during the elementary school years, a developmental stage in which students begin to establish beliefs about their abilities and academic potential. At this stage, students gradually form perceptions regarding intelligence, effort, and success that may influence their learning behaviors throughout subsequent educational experiences (Eccles & Wigfield, 2020). Research has consistently shown that students who possess stronger achievement motivation are more likely to set challenging goals, demonstrate resilience, and maintain positive attitudes toward learning activities (Howard et al., 2021).

Despite its importance, achievement motivation among elementary school students remains a persistent concern in many educational contexts. Several studies have reported declining motivation levels among students due to academic pressure, fear of failure, excessive performance comparisons, and limited opportunities to experience meaningful success in learning (Madigan & Curran, 2021; Burns et al., 2022). These challenges often result in reduced participation, lower academic engagement, and diminished learning outcomes, particularly among students who perceive themselves as having limited academic abilities.

The issue of low achievement motivation is also increasingly observed in elementary schools within developing countries. Students frequently encounter learning environments that emphasize performance outcomes rather than learning processes, leading them to associate academic success primarily with innate intelligence rather than effort and persistence (Bostwick et al., 2020). Such beliefs may discourage students from embracing challenges and reduce their willingness to persist when facing academic difficulties.

Contemporary educational research suggests that students' beliefs about intelligence significantly influence their motivational patterns and learning behaviors. One theoretical framework that has attracted substantial scholarly attention is the mindset theory proposed by Carol Dweck. According to this theory, individuals generally hold either a fixed mindset or a growth mindset regarding intelligence and ability (Dweck & Yeager, 2019). Students with a fixed mindset tend to believe that intelligence is static and unchangeable, whereas students with a growth mindset view intelligence as malleable and capable of development through effort, learning, and effective strategies.

The concept of growth mindset has gained considerable prominence because it offers a promising approach to fostering adaptive learning behaviors. Students who possess a growth mindset are more likely to embrace challenges, persist despite setbacks, seek feedback, and view mistakes as opportunities for learning and improvement (Yeager et al., 2019). These characteristics are closely aligned with the attributes associated with high achievement motivation, suggesting a potentially strong relationship between growth mindset and motivational development.

Recent empirical evidence has demonstrated that growth mindset interventions can positively influence various educational outcomes. Studies have shown that fostering growth mindset beliefs contributes to increased academic engagement, self-regulated learning, perseverance, and academic achievement across diverse educational settings (Sisk et al., 2018; Burnette et al., 2020). Furthermore, growth mindset interventions have

been found to be particularly beneficial for students who face academic challenges or possess lower levels of confidence in their abilities.

The mechanisms through which growth mindset influences achievement motivation can be explained from several psychological perspectives. Students who believe that intelligence can be developed tend to attribute success and failure to controllable factors such as effort, learning strategies, and persistence rather than fixed abilities (Claro et al., 2016). Such attributions encourage students to maintain motivation even when confronted with difficulties, thereby supporting sustained engagement in academic activities.

Growth mindset-based learning represents an instructional approach that intentionally integrates growth mindset principles into classroom practices. In this approach, teachers emphasize effort, learning processes, strategic thinking, and continuous improvement rather than solely focusing on performance outcomes (Rissanen et al., 2019). Through carefully designed learning experiences, students are encouraged to view challenges as opportunities for growth and to develop confidence in their capacity to improve through effort and practice.

The implementation of growth mindset-based learning has become increasingly relevant in the twenty-first century educational landscape. Modern education emphasizes lifelong learning, adaptability, creativity, and resilience, all of which require students to develop positive beliefs about learning and personal development (OECD, 2019). Consequently, educational approaches that promote growth-oriented thinking are receiving growing attention from both researchers and practitioners worldwide.

Several studies conducted in recent years have reported positive associations between growth mindset and student motivation. For example, research conducted by Bostwick et al. (2020) found that students with stronger growth mindset beliefs demonstrated higher levels of academic motivation and engagement. Similarly, Howard et al. (2021) reported that growth mindset was a significant predictor of students' persistence and willingness to invest effort in learning tasks.

In addition, intervention studies have shown that growth mindset-oriented programs can improve students' academic attitudes and motivational outcomes. Yeager et al. (2019) demonstrated that brief growth mindset interventions produced meaningful improvements in students' academic trajectories, particularly among those at risk of academic underachievement. Likewise, Burnette et al. (2020) found that growth mindset interventions positively affected goal-setting behaviors and persistence in challenging tasks.

Although the international literature provides growing evidence regarding the benefits of growth mindset interventions, empirical studies focusing specifically on elementary school students remain relatively limited. Much of the existing research has concentrated on secondary school and university populations, leaving a gap in understanding how growth mindset-based learning influences younger learners during critical developmental stages (Sisk et al., 2018; Macnamara & Burgoyne, 2023).

Furthermore, findings from previous studies have not always been consistent. While many researchers report positive effects of growth mindset interventions, others have found relatively small or context-dependent impacts on educational outcomes (Macnamara & Burgoyne, 2023). These variations suggest that the effectiveness of growth mindset-based learning may depend on contextual factors such as instructional design, implementation quality, cultural background, and student characteristics.

Within the Indonesian educational context, research on growth mindset remains relatively underdeveloped compared to studies conducted in North America, Europe, and East Asia. Existing studies have generally focused on higher education settings or have examined mindset as one of several psychological variables rather than as the central focus of instructional interventions (Pratama & Retnawati, 2018; Widodo et al., 2022). Consequently, evidence regarding the effectiveness of growth mindset-based learning for elementary school students in Indonesia remains insufficient.

The need for such research becomes increasingly important considering current educational challenges in Indonesian elementary schools. Many students continue to demonstrate low confidence, fear of making mistakes, and reluctance to engage in challenging learning activities. These conditions may negatively affect achievement motivation and ultimately hinder academic development. Educational interventions capable of fostering adaptive motivational beliefs are therefore urgently needed.

Growth mindset-based learning offers a theoretically grounded and practically feasible approach to addressing these challenges. By encouraging students to understand that abilities can develop through effort and learning, this approach may help cultivate stronger achievement motivation and greater resilience in academic settings (Rissanen et al., 2019; Burnette et al., 2020). However, empirical evidence is necessary to determine whether these theoretical advantages can be realized effectively within elementary school classrooms.

Another important consideration relates to the growing emphasis on student-centered learning approaches. Contemporary educational paradigms increasingly recognize students as active participants in knowledge construction rather than passive recipients of information (UNESCO, 2021). Growth mindset-based learning aligns closely with this perspective by promoting self-reflection, personal responsibility, and continuous improvement throughout the learning process.

The present study seeks to contribute to the existing body of knowledge by examining the effectiveness of growth mindset-based learning on elementary school students' achievement motivation. Unlike previous studies that primarily investigated correlational relationships, this research employs a quasi-experimental design to evaluate the causal impact of a structured instructional intervention. Such an approach provides stronger evidence regarding the effectiveness of growth mindset-based learning practices.

This study was conducted among sixth-grade students in Indonesian elementary schools, a population that has received limited attention in previous growth mindset research. By focusing on students at the end of their elementary education, the study provides valuable insights into how mindset-oriented instructional practices may influence achievement motivation during an important transitional stage of academic development.

The findings of this study are expected to offer both theoretical and practical contributions. Theoretically, the study extends understanding of the relationship between growth mindset-based learning and achievement motivation within elementary education. Practically, the findings may provide educators, school leaders, and policymakers with evidence-based guidance regarding the implementation of instructional approaches that foster students' motivational development and academic success.

Based on the theoretical framework and empirical gaps identified in previous studies, this research aims to investigate whether growth mindset-based learning significantly affects elementary school students' achievement motivation. The study addresses an important need for experimental evidence within the Indonesian elementary education context and seeks to contribute to the development of effective strategies for enhancing students' motivation to achieve academic excellence.

METHODS

Research Design

This study employed a quantitative approach using a quasi-experimental research design. The selection of a quantitative experimental method was based on the objective of the study, namely to examine the causal effect of growth mindset-based learning on elementary school students' achievement motivation. Experimental research is considered appropriate when researchers seek to determine whether a particular intervention

produces measurable changes in a dependent variable under controlled conditions (Creswell & Creswell, 2018; Fraenkel et al., 2019).

The quasi-experimental approach was selected because the researchers were unable to randomly assign students to experimental and control groups due to administrative and educational considerations in the participating schools. Instead, intact classes were utilized as naturally existing groups while maintaining comparable characteristics between groups. This approach is widely used in educational research because it allows intervention studies to be conducted within authentic classroom settings while preserving ecological validity (Ary et al., 2019).

The research specifically adopted a Nonequivalent Control Group Design. This design involves two groups that receive pre-test and post-test measurements, with only the experimental group receiving the treatment. The control group continued to receive conventional instruction without explicit integration of growth mindset principles. The use of both pre-test and post-test measurements enabled the researchers to examine changes occurring within each group as well as differences between groups after the intervention.

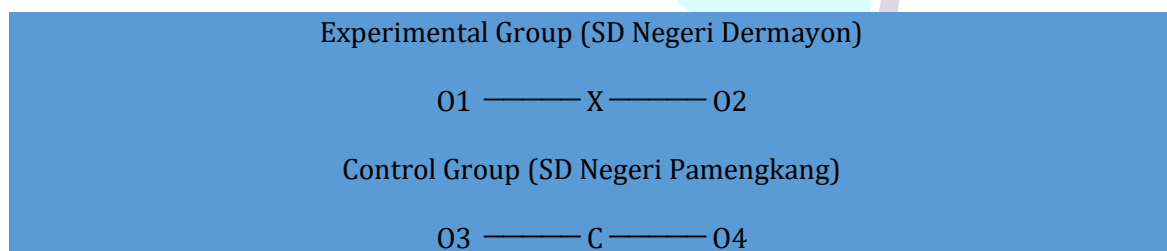


Figure 1. Research Design

Where:

- O₁ = Pre-test achievement motivation score of experimental group
- O₂ = Post-test achievement motivation score of experimental group
- O₃ = Pre-test achievement motivation score of control group
- O₄ = Post-test achievement motivation score of control group
- X = Growth mindset-based learning treatment
- C = Conventional learning

The independent variable in this study was growth mindset-based learning, while the dependent variable was students' achievement motivation. The conceptual relationship between the variables is illustrated in Figure 2.



Figure 2. Conceptual Framework

The intervention was conducted over eight consecutive weeks. During the treatment period, growth mindset principles were systematically integrated into daily learning activities. Students in the experimental class were consistently exposed to messages emphasizing effort, learning processes, strategic problem-solving, constructive feedback, and the belief that intelligence can be developed through continuous practice and persistence.

Research Setting and Participants

The study was conducted in two public elementary schools located in Indonesia, namely SD Negeri Dermayon and SD Negeri Pamengkang. These schools were selected because they possessed relatively similar characteristics in terms of curriculum implementation, student demographics, teacher qualifications, and academic environment.

The research participants consisted of sixth-grade students enrolled during the 2025/2026 academic year. Grade VI students were selected because they possess sufficient cognitive maturity to understand and internalize growth mindset concepts while simultaneously facing increasing academic demands that make achievement motivation particularly relevant.

A total of 60 students participated in the study. Thirty students from SD Negeri Dermayon were assigned as the experimental group, while thirty students from SD Negeri Pamengkang served as the control group.

Table 1. Distribution of Research Participants

Group	School	Number of Students
Experimental	SD Negeri Dermayon	30
Control	SD Negeri Pamengkang	30
Total	-	60

Before treatment implementation, both groups completed a pre-test achievement motivation questionnaire. Preliminary analyses indicated that the two groups possessed relatively comparable levels of achievement motivation prior to intervention, thereby supporting the validity of subsequent comparisons.

Growth Mindset-Based Learning Intervention

The treatment implemented in the experimental group was growth mindset-based learning. This instructional approach was developed based on the theoretical framework proposed by Dweck (2017), Yeager et al. (2019), and Rissanen et al. (2019).

The intervention emphasized five fundamental principles:

1. Intelligence can be developed through effort and learning.
2. Mistakes are opportunities for growth.
3. Challenges are valuable learning experiences.
4. Effective strategies contribute to success.
5. Persistence is more important than innate talent.

Teachers participating in the intervention received training before the study commenced. The training focused on growth mindset pedagogy, feedback techniques, motivational communication strategies, and classroom practices supporting adaptive learning beliefs.

Throughout the intervention period, teachers incorporated growth mindset principles into classroom instruction by providing process-oriented feedback, encouraging reflection on learning strategies, recognizing effort and persistence, facilitating collaborative problem-solving activities, and helping students reinterpret mistakes as opportunities for improvement.

Table 2. Components of Growth Mindset-Based Learning

Component	Description
Process-Oriented Feedback	Emphasis on effort, strategies, and persistence
Error Reflection	Analysis of mistakes as learning opportunities
Challenging Tasks	Activities requiring sustained effort
Goal Setting	Personal learning target formulation
Self-Reflection	Reflection on learning progress
Teacher Encouragement	Continuous motivational support

Research Instrument

Data were collected using an Achievement Motivation Questionnaire developed based on McClelland's achievement motivation theory and contemporary educational motivation literature. The instrument measured several dimensions of achievement motivation, including,

Table 3. Indicators of Achievement Motivation

Dimension	Indicator
Responsibility	Completing tasks independently
Persistence	Continuing efforts despite difficulties
Goal Orientation	Desire to achieve academic success
Challenge Seeking	Preference for moderately difficult tasks
Self-Improvement	Motivation to improve performance
Achievement Satisfaction	Positive feelings toward accomplishment

The questionnaire consisted of 25 items using a five-point Likert scale.

Table 4. Likert Scale Scoring

Response	Score
Strongly Agree	5
Agree	4
Neutral	3
Disagree	2
Strongly Disagree	1

Prior to implementation, the instrument underwent validity and reliability testing. Content Validity. Content validity was evaluated by three experts specializing in educational psychology and elementary education. The Content Validity Index (CVI) was calculated using:

$$CVI = \frac{\sum A}{N}$$

Where:

A = number of experts rating an item as relevant

N = total number of experts

Reliability Testing

Instrument reliability was determined using Cronbach's Alpha.

$$\alpha = \frac{k}{k-1} \left(1 - \frac{\sum \sigma_i^2}{\sigma_t^2} \right)$$

Where:

α = reliability coefficient

k = number of items

σ_i^2 = variance of each item

σ_t^2 = total variance

A Cronbach's Alpha value greater than 0.70 indicated satisfactory reliability.

Data Collection Procedure

Data collection was conducted in four stages. First, researchers obtained research permission from school authorities and informed consent from participants. Second, pre-test data were collected from both groups using the achievement motivation questionnaire. Third, the growth mindset-based learning intervention was implemented in the experimental group for eight weeks, while the control group continued conventional instruction. Fourth, post-test data were collected using the same questionnaire after completion of the intervention.

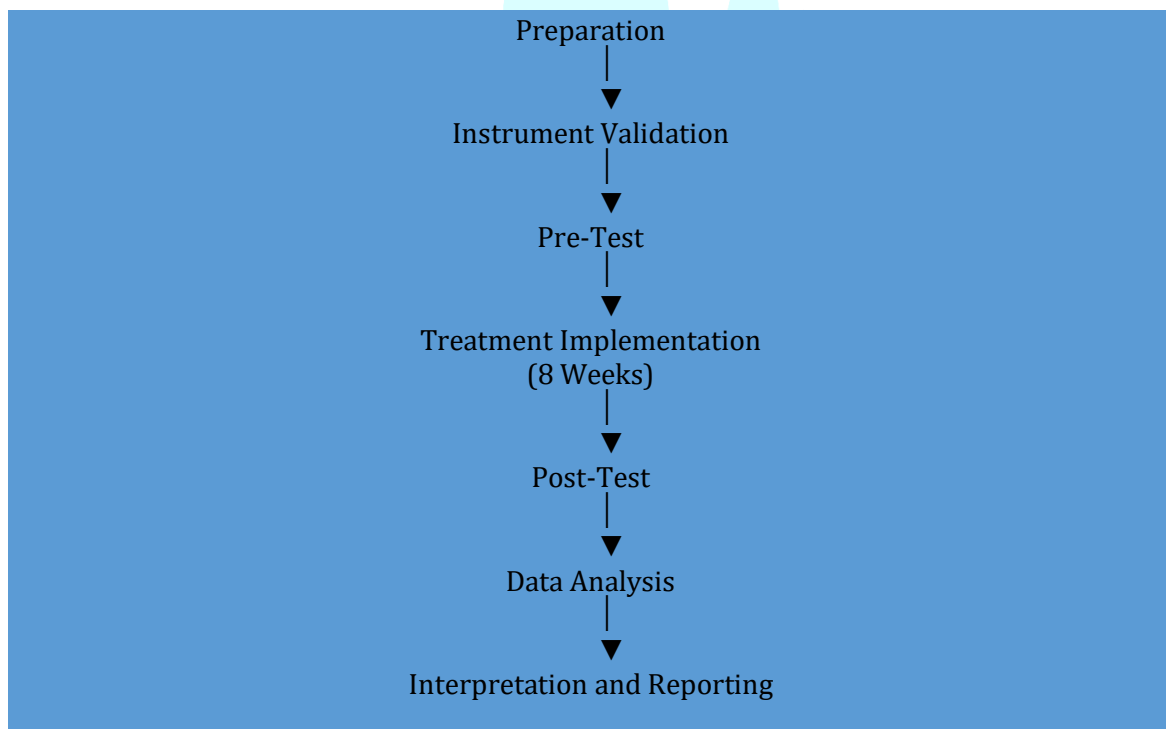


Figure 3. Research Procedure

Data Analysis Techniques

The collected data were analyzed using descriptive and inferential statistical techniques with the assistance of IBM SPSS Statistics.

Descriptive Statistical Analysis

Descriptive statistics were used to describe students' achievement motivation scores through means, standard deviations, minimum scores, maximum scores, and percentage distributions.

The mean score was calculated using:

$$\bar{X} = \frac{\sum X}{N}$$

Where:

$\bar{X}$ = mean score

$\sum X$ = total score

N = number of participants

The percentage score was calculated using:

$$P = \frac{F}{N} \times 100$$

Where:

P = percentage

F = frequency

N = total participants

Achievement motivation scores were interpreted according to the following criteria.

Table 5. Achievement Motivation Categorization

Score Range	Category
85–100	Very High
70–84	High
55–69	Moderate
40–54	Low
<40	Very Low

Normality Test

Normality testing was performed using the Shapiro–Wilk test because the sample size was below 50 participants per group.

Decision criteria:

$$p > 0.05$$

Data are normally distributed.

$$p < 0.05$$

Data are not normally distributed.

Homogeneity Test

Homogeneity of variance was tested using Levene's Test.

Hypotheses:

$$H_0: \sigma_1^2 = \sigma_2^2$$

$$H_a: \sigma_1^2 \neq \sigma_2^2$$

Decision rule:

$$p > 0.05$$

Variances are homogeneous.

$$p < 0.05$$

Variances are not homogeneous.

Independent Samples t-Test

To determine differences in post-test achievement motivation between the experimental and control groups, an Independent Samples t-Test was conducted.

The test statistic was calculated using:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2} \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}}$$

Where:

$\bar{X}_1$ = experimental group mean

$\bar{X}_2$ = control group mean

s_1^2 = experimental variance

s_2^2 = control variance

n_1 = experimental sample size

n_2 = control sample size

Paired Samples t-Test

To examine improvements in achievement motivation within the experimental group before and after treatment, a Paired Samples t-Test was employed.

$$t = \frac{\bar{D}}{S_D / \sqrt{n}}$$

Where:

$\bar{D}$ = mean difference

S_D = standard deviation of differences

n = number of paired observations

Effect Size Analysis

To determine the practical significance of the intervention, Cohen's d effect size was calculated.

$$d = \frac{\bar{X}_{post} - \bar{X}_{pre}}{S_{pooled}}$$

Where:

$$S_{pooled} = \sqrt{\frac{S_1^2 + S_2^2}{2}}$$

Interpretation:

Table 6. Effect Size Interpretation

Cohen's d	Interpretation
0.20	Small Effect
0.50	Medium Effect
0.80 or higher	Large Effect

The significance level adopted throughout the study was $\alpha = 0.05$. A significance value below 0.05 indicated rejection of the null hypothesis and acceptance of the

alternative hypothesis, demonstrating a statistically significant effect of growth mindset-based learning on students' achievement motivation.

RESULTS

The primary objective of this study was to determine the effectiveness of growth mindset-based learning in improving elementary school students' achievement motivation. To address this objective, the collected data were analyzed using descriptive and inferential statistical procedures. The descriptive analysis was conducted to identify trends and changes in achievement motivation scores before and after the intervention, while the inferential analysis was conducted to determine the statistical significance of the observed differences.

Prior to treatment implementation, both groups completed a pre-test achievement motivation questionnaire. The pre-test was administered to determine the initial condition of students and to ensure comparability between the experimental and control groups before the intervention. Table 7 presents the descriptive statistics of achievement motivation scores in both groups during the pre-test and post-test stages.

Table 7. Descriptive Statistics of Achievement Motivation Scores

Group	Test	N	Mean	SD	Minimum	Maximum	Category
Experimental	Pre-test	30	67.35	7.42	54	79	Low
Experimental	Post-test	30	91.08	5.13	81	99	Very High
Control	Pre-test	30	66.87	7.18	53	78	Low
Control	Post-test	30	65.19	6.94	52	77	Low

Table 7 demonstrates a substantial increase in achievement motivation scores among students in the experimental group after receiving growth mindset-based learning. The mean score increased from 67.35 during the pre-test to 91.08 during the post-test, indicating an improvement of 23.73 points. According to the predetermined categorization criteria, students in the experimental group moved from the low category to the very high category.

The control group showed no meaningful improvement. The mean score decreased slightly from 66.87 during the pre-test to 65.19 during the post-test. The category remained within the low level of achievement motivation. The comparison of mean scores indicates that students exposed to growth mindset-based learning experienced substantially higher achievement motivation than students who received conventional instruction. The difference between the post-test means of the experimental and control groups reached 25.89 points.

The standard deviation values also provide important information regarding score distribution. Before treatment, the experimental group demonstrated a standard deviation of 7.42, while the control group demonstrated a standard deviation of 7.18. These values indicate relatively similar variability in achievement motivation among students in both groups.

Following the intervention, the standard deviation of the experimental group decreased to 5.13. This reduction suggests that students' achievement motivation scores became more homogeneous after receiving growth mindset-based learning. In other words, the intervention not only increased motivation levels but also contributed to more consistent motivational outcomes across students.

Meanwhile, the control group demonstrated a post-test standard deviation of 6.94, indicating relatively stable variability between pre-test and post-test measurements. This finding suggests that conventional instruction did not substantially influence either the overall level or distribution of achievement motivation. To further examine student

achievement motivation attainment, percentage distributions based on achievement motivation categories were calculated.

Table 8. Distribution of Achievement Motivation Categories

Category	Experimental Pre-test (%)	Experimental Post-test (%)	Control Pre-test (%)	Control Post-test (%)
Very High	0.00	80.00	0.00	0.00
High	26.67	20.00	23.33	20.00
Moderate	40.00	0.00	43.33	40.00
Low	33.33	0.00	33.33	40.00
Very Low	0.00	0.00	0.00	0.00

The percentage analysis reveals that before treatment, the majority of students in both groups were concentrated within the moderate and low achievement motivation categories. None of the students in either group achieved the very high category. After the intervention, 80% of students in the experimental group reached the very high category, while the remaining 20% reached the high category. No students remained in the moderate or low categories.

By contrast, the control group continued to exhibit low achievement motivation. Forty percent of students remained within the low category, and none achieved the very high category.

The substantial increase in the proportion of students classified as very highly motivated in the experimental group indicates the practical effectiveness of growth mindset-based learning. Before conducting hypothesis testing, prerequisite analyses were performed to verify compliance with parametric statistical assumptions. The first prerequisite test involved normality testing using the Shapiro–Wilk procedure.

Table 9. Results of the Shapiro–Wilk Normality Test

Group	Test	Statistic	Sig.
Experimental	Pre-test	0.964	0.354
Experimental	Post-test	0.971	0.512
Control	Pre-test	0.958	0.278
Control	Post-test	0.967	0.411

The significance values for all datasets exceeded 0.05. Therefore, the null hypothesis of normal distribution was accepted.

These findings indicate that all achievement motivation data were normally distributed and suitable for further analysis using parametric statistical techniques.

The second prerequisite analysis involved testing the homogeneity of variance using Levene's Test.

Table 10. Results of the Homogeneity Test

Variable	Levene Statistic	Sig.
Post-test Achievement Motivation	0.483	0.489

The significance value obtained from Levene's Test was 0.489, which exceeded the threshold value of 0.05.

Accordingly, the variances of the experimental and control groups were considered homogeneous. This result fulfilled another prerequisite for conducting parametric hypothesis testing.

After confirming normality and homogeneity assumptions, hypothesis testing was conducted using Paired Samples t-Test and Independent Samples t-Test. The Paired Samples t-Test was first conducted to examine changes in achievement motivation within the experimental group.

Table 11. Results of the Paired Samples t-Test

Comparison	Mean Difference	t	df	Sig. (2-tailed)
Experimental Pre-test vs Post-test	23.73	16.845	29	0.000

The analysis revealed a significance value of 0.000, which was smaller than 0.05. This finding indicates a statistically significant increase in achievement motivation after students participated in growth mindset-based learning. The large positive mean difference further confirms the substantial magnitude of improvement resulting from the intervention. An Independent Samples t-Test was subsequently conducted to compare post-test scores between the experimental and control groups.

Table 12. Results of the Independent Samples t-Test

Comparison	Mean Difference	t	df	Sig. (2-tailed)
Experimental vs Control Post-test	25.89	16.117	58	0.000

The significance value obtained from the Independent Samples t-Test was 0.000, which was lower than the alpha level of 0.05. Consequently, the null hypothesis was rejected and the alternative hypothesis was accepted.

This result demonstrates that students who received growth mindset-based learning achieved significantly higher achievement motivation than students who participated in conventional instruction. To determine the practical significance of the intervention, effect size analysis was performed.

Table 13. Effect Size Analysis

Comparison	Cohen's d	Interpretation
Experimental Pre-test vs Post-test	2.87	Large Effect

The obtained Cohen's d value of 2.87 exceeds the threshold for a large effect size. This result indicates that growth mindset-based learning exerted a very strong practical impact on students' achievement motivation.

The descriptive and inferential statistical findings consistently support the effectiveness of growth mindset-based learning. The intervention significantly increased achievement motivation levels, reduced score variability, improved the proportion of highly motivated students, and produced statistically as well as practically significant effects.

DISCUSSION

The findings of this study provide compelling evidence that growth mindset-based learning significantly improves elementary school students' achievement motivation. The descriptive statistics demonstrated a substantial increase in achievement motivation scores among students who participated in the intervention, while the inferential analyses confirmed that these improvements were statistically significant. These findings support the central proposition of mindset theory that students' beliefs regarding the malleability of intelligence can influence their motivation and learning behaviors (Dweck & Yeager, 2019).

One of the most notable findings was the increase in the experimental group's mean achievement motivation score from 67.35 to 91.08. This substantial improvement suggests that students became considerably more motivated after participating in growth mindset-oriented learning experiences. Such findings align with previous research indicating that growth mindset interventions can foster stronger academic motivation by encouraging students to view challenges as opportunities for learning rather than threats to competence (Yeager et al., 2019).

The movement from the low category to the very high category further highlights the transformative potential of growth mindset-based learning. Achievement motivation is often regarded as a relatively stable psychological construct; therefore, changes of this magnitude suggest that classroom practices can meaningfully influence students' motivational orientations when implemented systematically and consistently (Howard et al., 2021).

The findings also demonstrate that students who received conventional instruction did not experience similar improvements. The slight decline in achievement motivation observed within the control group suggests that motivational development does not occur automatically over time. Instead, students require learning environments that actively cultivate adaptive beliefs about effort, learning, and personal growth. This observation is consistent with the findings of Eccles and Wigfield (2020), who argued that motivational beliefs are strongly shaped by educational experiences and instructional practices.

Another important finding concerns the reduction in standard deviation observed in the experimental group after treatment. This decrease indicates that achievement motivation became more evenly distributed among students. In practical terms, growth mindset-based learning appears to benefit not only highly motivated students but also those who initially demonstrate lower motivational levels. Such findings support the argument that mindset interventions can contribute to educational equity by helping a broader range of students develop positive learning attitudes (Claro et al., 2016).

The percentage distribution analysis provides further insight into the effectiveness of the intervention. Before treatment, no students in the experimental group were categorized as having very high achievement motivation. Following the intervention, 80% of students reached this category. This dramatic shift suggests that growth mindset-based learning can produce meaningful improvements at the population level rather than merely affecting a small subset of students.

These results are consistent with the national intervention study conducted by Yeager et al. (2019), which demonstrated that growth mindset interventions can positively alter students' academic trajectories. Although the contexts differ, both studies indicate that interventions targeting beliefs about intelligence can generate measurable improvements in educational outcomes.

The significant paired-samples t-test result further confirms the effectiveness of the intervention. The large mean difference between pre-test and post-test scores indicates that students experienced substantial motivational growth throughout the intervention period. This finding supports the theoretical assumption that students become more willing to invest effort when they believe that ability can be developed through practice and persistence (Burnette et al., 2020).

The independent samples t-test results revealed a statistically significant difference between the experimental and control groups at the conclusion of the study. This finding is particularly important because it demonstrates that the observed improvements cannot be attributed solely to maturation, classroom routines, or external influences. Instead, the results suggest that growth mindset-based learning was the primary factor contributing to increased achievement motivation.

From a theoretical perspective, the findings can be explained through attribution theory. Students with growth mindset beliefs tend to attribute success and failure to controllable factors such as effort and strategy use rather than innate ability (Claro et al.,

2016). Such attributions promote persistence because students perceive academic outcomes as improvable through their own actions.

The findings also support social cognitive theory, which emphasizes the role of self-beliefs in regulating behavior and motivation (Schunk & DiBenedetto, 2020). Growth mindset-based learning may enhance students' confidence in their ability to improve, thereby strengthening self-regulation and achievement-oriented behaviors.

Another possible explanation involves students' responses to academic challenges. Growth mindset pedagogy encourages learners to interpret difficulties as normal components of the learning process. Consequently, students become less likely to avoid challenging tasks and more likely to persevere when difficulties arise. This interpretation is consistent with findings reported by Rissanen et al. (2019), who observed that growth mindset-oriented classrooms promote adaptive responses to challenge and failure.

The exceptionally large effect size obtained in this study indicates that the intervention had substantial practical significance. Although previous meta-analyses have reported varying effect sizes for growth mindset interventions (Sisk et al., 2018; Macnamara & Burgoyne, 2023), the present findings suggest that well-structured and contextually relevant implementations can produce strong educational benefits.

One factor contributing to the intervention's effectiveness may have been the integration of growth mindset principles into everyday classroom activities rather than presenting them as isolated lessons. Continuous exposure to growth-oriented messages likely reinforced students' beliefs and facilitated internalization of mindset principles.

Teacher involvement may also have played a crucial role in the observed outcomes. Teachers who consistently emphasized effort, strategic learning, and persistence created a classroom climate supportive of motivational development. Previous studies have highlighted teachers as key agents in the successful implementation of growth mindset practices (Rissanen et al., 2019).

The findings additionally suggest that growth mindset-based learning may be particularly valuable during late elementary school years. Students at this developmental stage are increasingly capable of reflecting on their abilities and learning processes. Therefore, interventions targeting beliefs about intelligence may exert stronger effects because students can consciously apply these beliefs to academic situations.

The results have important implications for elementary education. Schools seeking to improve student motivation may benefit from incorporating growth mindset principles into instructional planning, teacher professional development, and classroom assessment practices. Such initiatives could contribute to more positive and resilient learning cultures.

From a curriculum perspective, growth mindset-based learning aligns with contemporary educational goals emphasizing lifelong learning, adaptability, resilience, and self-directed improvement. These competencies are increasingly important in rapidly changing educational and societal contexts (OECD, 2019; UNESCO, 2021).

The study also contributes to the limited body of research examining growth mindset interventions within Indonesian elementary education. Most previous studies have focused on secondary or higher education contexts. Consequently, the present findings provide valuable evidence regarding the applicability of growth mindset pedagogy among younger learners.

Nevertheless, the findings should be interpreted with caution. The study involved a relatively limited sample drawn from two schools, which may affect generalizability. Future studies involving larger and more diverse populations would provide stronger evidence regarding the effectiveness of growth mindset-based learning across different educational contexts.

Future research may also investigate the long-term sustainability of motivational improvements resulting from growth mindset interventions. Longitudinal studies could determine whether gains in achievement motivation persist beyond the intervention period and whether they translate into improved academic achievement and other educational outcomes.

The findings demonstrate that growth mindset-based learning constitutes an effective educational approach for enhancing elementary school students' achievement motivation. The consistent evidence obtained from descriptive analyses, prerequisite testing, hypothesis testing, and effect size analysis indicates that fostering growth-oriented beliefs can significantly strengthen students' motivation to learn, persist, and achieve academic success.

CONCLUSION

This study concludes that growth mindset-based learning has a positive and statistically significant effect on elementary school students' achievement motivation. Students who participated in the intervention demonstrated substantial improvements in achievement motivation, as reflected in the increase in mean scores from the pre-test to the post-test and the significantly higher post-test scores compared with students who received conventional instruction. The findings indicate that integrating growth mindset principles into classroom learning can support the development of more positive motivational attitudes by encouraging students to view effort, challenges, and mistakes as important components of the learning process. Although the results provide evidence of the potential benefits of growth mindset-based learning in elementary education, they should be interpreted within the context of the study's sample and setting. Therefore, further research involving larger samples, different educational contexts, and longer intervention periods is recommended to strengthen understanding of the effectiveness and sustainability of growth mindset-based learning in promoting students' achievement motivation.

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