

Growth-mindset in the third-grade classroom and its effects on performance levels: Basis for a growth-mindset development program

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Abstract

Aim: This study investigated the effects of a growth mindset approach on the mathematics performance of third-grade pupils and served as the basis for the development of a school-based Growth Mindset Development Program. The study sought to determine whether growth mindset strategies could enhance learners' academic performance, resilience, and engagement in mathematics instruction.

Methodology: The study employed a quasi-experimental one-group pretest-posttest design involving 52 third-grade pupils from a public elementary school. Anchored in Carol Dweck's Growth Mindset Theory, the research examined differences between pupils' pretest and posttest mathematics performance and determined whether significant differences existed in growth mindset scores when pupils were grouped according to gender, family background, and attendance.

Results: Findings revealed a statistically significant improvement in mathematics performance following the implementation of the growth mindset intervention. Pupils demonstrated higher posttest scores compared to their pretest scores, indicating enhanced academic achievement. A statistically significant difference in growth mindset scores was found according to gender, while no statistically significant differences were found according to family background and attendance.

Conclusion: The findings suggest that integrating growth mindset strategies into mathematics instruction can contribute to improved learner performance, persistence, and engagement. The results support the implementation of a collaborative Growth Mindset Development Program involving school administrators, teachers, and parents to promote positive learning behaviors and strengthen academic achievement among elementary learners. The study highlights the potential of growth mindset practices as an instructional approach for enhancing mathematics learning and supporting educational success.

Keywords: *growth mindset, mathematics achievement, elementary education, learner engagement, resilience, instructional strategies*

INTRODUCTION

Mathematics has remained one of the most critical learning areas in elementary education, as it provides pupils with the foundational problem-solving and critical-thinking skills necessary for future academic success (Mullis et al., 2020). Despite its importance, a substantial proportion of learners across educational systems continued to struggle with mathematics, not solely because of the complexity of the content but also because of the beliefs that learners held about their own abilities (Organisation for Economic Co-operation and Development [OECD], 2023). Mindset, defined as an individual's beliefs about whether intelligence and ability are fixed or capable of development, has been identified as a significant factor influencing how pupils responded to academic challenges, setbacks, and difficult learning tasks (Yeager & Dweck, 2020). The construct of growth mindset, which referred to the belief that abilities could be developed through effort, effective strategies, and persistence, has become an important area of interest in education because it directly addressed learners' motivational orientation toward mathematics (Yeager & Dweck, 2020). Pupils who held a growth mindset were found to remain more motivated, to persevere through difficulties, and to achieve better academic outcomes than pupils who held a fixed mindset (Zhao et al., 2023). Recent research further



indicated that growth mindset was positively associated with mathematics achievement across diverse educational settings, including among middle school and university learners (Chen et al., 2024).

Growth mindset interventions were also found to reduce achievement gaps and improve student engagement, particularly in mathematics classrooms (Dong et al., 2023). A systematic review and meta-analysis of growth mindset interventions confirmed that such interventions could produce meaningful, although variable, effects on academic achievement depending on implementation quality and contextual factors (Macnamara & Burgoyne, 2023). Notwithstanding these promising findings, there remained limited research focusing specifically on the impact of growth mindset interventions among elementary pupils, particularly within third-grade mathematics classrooms (Zhao et al., 2023).

Similar concerns regarding mathematics achievement and learner engagement have also been reported across schools in the United States. National assessments have shown that many elementary learners continue to perform below proficiency levels in mathematics, particularly following the educational disruptions associated with the COVID-19 pandemic. Reports from the National Assessment of Educational Progress (NAEP) indicated that mathematics achievement among elementary students remained below pre-pandemic levels, highlighting ongoing challenges in mathematical reasoning, problem solving, and academic persistence. In addition, widening achievement disparities among student populations have prompted educators to seek evidence-based interventions that support both academic achievement and positive learning behaviors in mathematics classrooms. Recent studies have continued to demonstrate that growth mindset interventions can positively influence mathematics achievement, particularly when integrated into classroom instruction and reinforced through teacher feedback and reflective learning practices (Chen et al., 2024; Zhao et al., 2023). These national concerns underscore the relevance of examining growth mindset as an educational intervention in elementary mathematics classrooms.

At David Hill Community Learning Center (CLC) in Akron, Ohio, mathematics performance among third-grade pupils had been an ongoing concern. Many pupils performed below grade-level expectations on standardized diagnostic assessments and often lacked confidence when faced with challenging mathematical tasks. Classroom observations indicated that some pupils were quick to give up when they made mistakes or encountered difficulties, suggesting that factors beyond academic ability, such as motivational beliefs, may have been affecting their performance. This situation highlighted the need for instructional approaches that strengthened not only mathematical skills but also pupils' confidence, resilience, and willingness to learn.

While previous studies have examined the relationship between growth mindset and academic achievement, many focused on adolescents, secondary school students, or university learners rather than elementary pupils (Macnamara & Burgoyne, 2023; Zhao et al., 2023). Few studies have explored how growth mindset strategies affected the mathematics performance of third-grade pupils while also considering demographic factors such as gender, family background, and attendance. Attendance, in particular, has emerged as a growing concern in elementary education, as recent national data indicated that chronic absenteeism remained significantly elevated in elementary schools compared to pre-pandemic levels and continued to be associated with declines in mathematics achievement.

The proposed growth mindset development program extends beyond classroom implementation by promoting collaboration among school administrators, teachers, and parents in supporting positive learning behaviors. The findings highlight the importance of teacher professional development in growth mindset pedagogy and encourage school leaders to support mindset-focused initiatives. The program's innovative feature lies in integrating mindset-based instruction, school-home collaboration, and data-informed monitoring of learner progress within elementary mathematics instruction. The findings may also inform school improvement efforts and policies aimed at strengthening learner motivation, resilience, and mathematics achievement.

Review of Related Literature and Studies

Growth Mindset and Fixed Mindset

Growth Mindset Theory (Dweck, 2006) posits that intelligence can be developed through effort, persistence, and effective learning strategies. Learners with a growth mindset are more likely to embrace challenges and learn from mistakes.

Yeager and Dweck (2020) emphasized that pupils who believe intelligence can be developed are more likely to sustain effort and achieve positive academic outcomes. More recently, Chen et al. (2024) found that growth mindset was positively associated with mathematics achievement, learner engagement, and academic persistence among school-aged learners. These findings suggest that growth mindset serves as an important motivational factor that supports academic success and provides a theoretical foundation for the present study.

Application of the Growth Mindset in the Classroom

Growth-mindset strategic teaching pedagogy was found to have a positive impact on fostering growth mindset beliefs among learners, and a noticeable contrast was observed in the growth mindset effect between teaching approaches that employed growth-mindset strategies and traditional lecture-style teaching (Yeager & Dweck, 2020; Zhao et al., 2023). The main objective of growth mindset interventions was to help pupils shift their fixed mindset beliefs toward a growth mindset by recognizing that human abilities were not fixed and could be developed. Such interventions supported ongoing academic progress through self-reinforcing motivational cycles and a mastery-learning orientation (Dweck, 2006; Yeager & Dweck, 2020).

Likewise, previous research demonstrated that a growth mindset intervention program implemented among primary school pupils in China improved their academic outcomes. The intervention was found to be effective and feasible, to a certain extent, in enhancing pupils' growth mindset, beliefs about failure, positive learning strategies, and academic achievement (Zhao et al., 2023). A systematic review of growth mindset interventions among elementary learners similarly indicated that intervention components, instructional fidelity, and program duration influenced the magnitude of academic gains, underscoring the importance of well-designed, sustained interventions rather than brief, one-time activities (Macnamara & Burgoyne, 2023). Recent studies further suggested that when growth mindset practices are integrated into daily mathematics instruction, pupils demonstrated higher levels of engagement, persistence, and academic achievement, highlighting the importance of combining motivational and instructional approaches in elementary mathematics classrooms. Recent studies have emphasized that effective elementary mathematics instruction combines cognitive skill development with motivational support systems. Research conducted by Chen et al. (2024) demonstrated that pupils who received growth-mindset-oriented mathematics instruction showed higher levels of engagement, persistence, and achievement compared to pupils exposed to traditional instructional approaches. These findings suggest that growth mindset interventions may be most effective when embedded within daily mathematics teaching practices rather than delivered as stand-alone activities.

Academic Achievement, Gender, and Family Background

Previous research has reported differences in academic performance across gender groups, suggesting that male and female learners may experience educational outcomes differently depending on contextual and instructional factors (Tsaousis & Alghamdi, 2022). Understanding these differences is important when examining learner characteristics that may influence growth mindset development and academic performance in mathematics.

Recent studies have continued to demonstrate that family support and parental involvement remain important predictors of pupils' academic engagement, motivation, and achievement (Kantová, 2024). Although pupils from solo-parent households may encounter additional socioeconomic and emotional challenges, positive home-school partnerships and supportive learning environments can mitigate these effects and promote resilience and academic success.

Attendance and Academic Outcomes

Attendance has been recognized as a crucial factor influencing pupils' academic success and overall school experience, and it has been closely linked to growth mindset and other educational outcomes. Chronic absenteeism has been found to be strongly associated with lower academic performance, reduced school engagement, and poorer long-term educational outcomes. Recent national data confirmed that elementary schools continued to experience elevated levels of chronic absenteeism relative to pre-pandemic levels, and increased absenteeism was associated with declines in mathematics achievement, educational engagement, and socioemotional outcomes among elementary learners (Gottfried, 2014; National Assessment Governing Board, 2025). Absences may result in pupils missing classroom experiences, peer interactions, and learning opportunities that are essential for promoting a growth mindset, underscoring the importance of examining attendance alongside instructional interventions such as the one investigated in this study.

Synthesis and Research Gap

The reviewed literature demonstrated broad support for the use of growth mindset strategies in improving pupils' beliefs about their capabilities and, consequently, their academic achievement. However, the identified gaps in previous research revealed a predominant focus on growth mindset strategies among adolescents and university learners, with comparatively limited attention given to elementary pupils, particularly those in the early grades (Chen et al., 2024). Furthermore, while the importance of family support and attendance has been acknowledged in prior

research, there remained limited discussion of how these demographic factors interacted with growth mindset outcomes among third-grade pupils specifically. Limited studies have examined growth mindset interventions among third-grade pupils while considering gender, family background, and attendance. This gap justified the conduct of the present study.

Theoretical Framework

This study was anchored on Dweck's (2006) Growth Mindset Theory, which posits that intelligence and abilities can be developed through effort, effective strategies, and persistence. The theory guided the intervention, data collection, and interpretation of findings by explaining how learners' beliefs about their abilities may influence mathematics performance.

Conceptual Framework

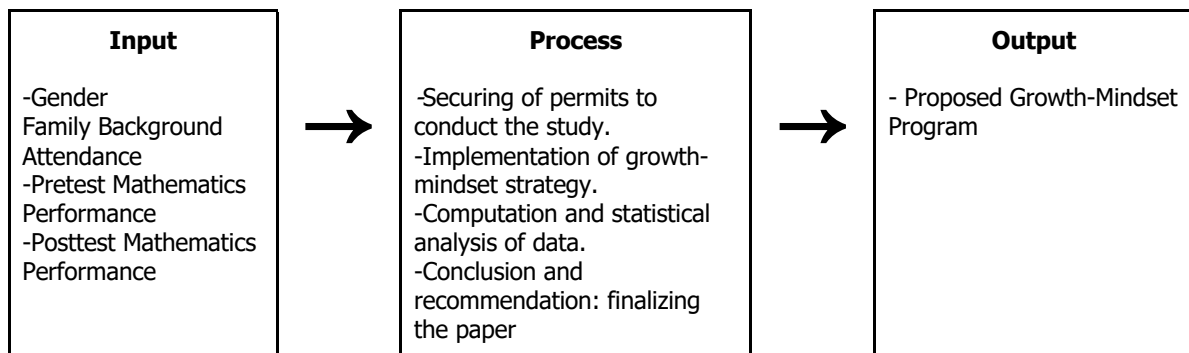


Figure 1
Conceptual Framework of the Study

The conceptual framework illustrates the relationship among the variables examined in the study. The input consists of the respondents' demographic profile and mathematics performance as measured through pretest and posttest scores. The process involves the implementation of growth-mindset strategies during mathematics instruction and the statistical analysis of the collected data.

The output is the proposed growth-mindset program for third-grade mathematics pupils, which could improve academic performance and general pupil success.

Statement of the Problem

Mathematics achievement remains a persistent educational concern among elementary learners, particularly among pupils who demonstrate low confidence, limited persistence, and difficulty responding positively to academic challenges. Research has suggested that learners' beliefs about their abilities, particularly their growth mindset, may influence their motivation, resilience, and academic performance. Despite the growing body of literature on growth mindset interventions, limited studies have examined their effectiveness among third-grade pupils in mathematics and their association with demographic factors such as gender, family background, and attendance. Therefore, this study sought to determine the effects of a growth mindset approach on the mathematics performance of third-grade pupils and to examine whether growth mindset outcomes differed according to selected demographic characteristics. The findings served as the basis for the development of a Growth Mindset Development Program for elementary learners.

General Objective

To determine the effects of a growth mindset approach on the mathematics performance of third-grade pupils and to develop a Growth Mindset Development Program based on the findings.

Specific Objectives

This study aimed to:

1. Determine the demographic profile of the respondents in terms of:
 - 1.1 gender;

- 1.2 family background; and
- 1.3 attendance.
2. Determine the mathematics performance of the respondents based on their:
 - 2.1 pretest scores; and
 - 2.2 posttest scores.
3. Determine whether a significant difference exists between the pretest and posttest mathematics scores of the respondents.
4. Determine whether significant differences exist in the growth mindset scores of the respondents when grouped according to:
 - 4.1 gender;
 - 4.2 family background; and
 - 4.3 attendance.

Research Questions

1. What is the demographic profile of the third-grade pupils in terms of:
 - 1.1 gender;
 - 1.2 family background; and
 - 1.3 attendance?
2. What is the mathematics performance of the third-grade pupils in terms of:
 - 2.1 pretest scores; and
 - 2.2 posttest scores?
3. Is there a significant difference between the pretest and posttest mathematics performance of the third-grade pupils?
4. Is there a significant difference in the growth mindset scores of the third-grade pupils when grouped according to:
 - 4.1 gender;
 - 4.2 family background; and
 - 4.3 attendance?

Hypotheses

H₀₁: There is no significant difference between the pretest and posttest mathematics performance of the third-grade pupils.

H₀₂: There are no significant differences in the growth mindset scores of the third-grade pupils when grouped according to gender, family background, and attendance.

METHODOLOGY

Research Design

The study employed a quasi-experimental one-group pretest-posttest research design to determine the effect of the growth mindset intervention on the mathematics performance of third-grade pupils. Quasi-experimental designs are appropriate in educational settings where random assignment is not feasible and where researchers seek to examine the effects of interventions within naturally occurring groups (Handley et al., 2018). The pretest established baseline mathematics performance prior to the intervention, while the posttest measured changes following implementation of the growth mindset approach. The group exposed to the intervention participated in growth-mindset strategies integrated into mathematics activities throughout the school year. This design was appropriate because it allowed the researcher to examine changes in mathematics performance over time within a naturally occurring classroom setting while comparing outcomes across demographic groups.

Population and Sampling

The study involved 52 third-grade pupils enrolled in a public elementary school during the 2024–2025 school year. Participants were selected through purposive sampling because they belonged to the class that received the growth-mindset intervention integrated into regular mathematics instruction. Detailed demographic characteristics of the participants are presented in the Results and Discussion section.

Research Instruments

The study utilized both adopted and researcher-made instruments. Mathematics performance was measured using the adopted i-Ready Diagnostic Mathematics Assessment, a computer-adaptive, nationally standardized assessment used to evaluate pupils' mathematical knowledge and skills across grade-level domains. The assessment is widely used in elementary schools throughout the United States and has established validity and reliability for measuring mathematics achievement. Attendance records were obtained from official school documents. The demographic profile form was researcher-made and was developed to gather information regarding gender, family background, and attendance status.

Growth mindset was measured using an adapted Growth Mindset Scale consisting of 10 Likert-type statements designed to assess pupils' beliefs regarding effort, learning, persistence, and the malleability of intelligence. Responses were rated on a four-point scale ranging from Strongly Disagree (1) to Strongly Agree (4). Sample items included: "I can improve in mathematics if I practice," and "Mistakes help me learn." Higher total scores indicated stronger growth mindset beliefs. The instrument was adapted from established growth mindset measures developed by Dweck (2006) and later validated in educational research. The adapted Growth Mindset Scale demonstrated acceptable content validity through expert review by three specialists in educational psychology, curriculum, and educational research, and their recommendations were incorporated prior to administration.

To ensure content validity of the demographic profile form, the instrument was reviewed by three validators holding master's or doctoral degrees in education, curriculum development, and educational research. The validators examined the instrument for clarity, appropriateness, alignment with the study objectives, and consistency with the information required for the analysis. Their recommendations were incorporated into the final version of the instrument prior to administration.

Reliability of the Growth Mindset Scale

Internal consistency reliability was assessed using Cronbach's alpha based on the responses of the 52 participants who completed the Growth Mindset Scale. The 10-item scale obtained a Cronbach's alpha coefficient of .714, indicating acceptable internal consistency reliability. According to Nunnally and Bernstein (1994), reliability coefficients of .70 or higher are generally considered acceptable for educational and social science research. The result suggests that the items consistently measured the construct of growth mindset among the participants.

Data Collection Procedure

Following parental consent and approval from school administration, participants completed the i-Ready Diagnostic Mathematics Assessment as the pretest. Growth mindset strategies, including lessons on brain plasticity, positive self-talk, goal setting, effort-based praise, reflection on mistakes, and persistence during problem-solving, were integrated into mathematics instruction from September 2024 to May 2025. At the conclusion of the intervention, participants completed the posttest using the same assessment under comparable testing conditions. The Growth Mindset Scale was then administered, and the resulting scores were analyzed according to gender, family background, and attendance.

Treatment of Data

The following statistical treatment of data was used in gathering data.

Frequencies and percentages were used to describe the demographic profile of the respondents. Means and standard deviations summarized mathematics performance. A paired-samples t-test was used to determine the significant difference between the pretest and posttest mathematics performance scores of the respondents. Independent-samples t-tests were used to determine whether significant differences existed in growth mindset scores when respondents were grouped according to gender, family background, and attendance status.

Ethical Considerations

Prior to conducting the study, permission was obtained from the school principal and the Akron Public Schools administration. Because the study involved routine educational practices conducted within the regular classroom setting, ethical oversight was provided through the school's administrative review process. Participation was voluntary, and the purpose of the study was explained to both parents and students prior to data collection.

Participation in the study did not influence pupils' academic grades, classroom standing, or access to instructional activities. All growth-mindset activities formed part of regular classroom instruction and were provided to all pupils regardless of participation status. Parents were informed that participation was voluntary and that refusal to

participate would not result in any academic penalty. To maintain confidentiality and objectivity, data were coded and analyzed using anonymous identifiers, and individual pupil identities were not disclosed during data analysis or reporting.

RESULTS AND DISCUSSION

This research presents its findings according to the data gathered and a logically structured discussion of the results. The study examined how facilitating a growth-mindset approach in third-grade math classrooms affected pupil performance by comparing data from before and after the intervention. The research assessed third-grade pupil learning experiences through multiple factors that extend past academic performance scores by analyzing gender distinctions, family backgrounds, and school attendance records.

Growth mindset scores were derived from the Growth Mindset Scale administered after the intervention. Higher scores reflected stronger endorsement of growth mindset beliefs, including persistence, effort, and learning from mistakes.

1. What is the demographic profile of the third-grade pupils?

Table 1

Profile of Third-Grade Pupils by Gender

Gender	Frequenc y(n=52)	Percent
Male	25	48.1%
Female	27	51.9%
Total	52	100.0%

The respondents were almost equally distributed by gender, providing a balanced representation for examining differences in growth mindset outcomes and mathematics performance across groups.

Table 2

Profile of Third-Grade Pupils by Family Background

Family Background	Frequenc y(n=52)	Percent
Both Parents	16	30.8%
Solo Parents	36	69.2%
Total	52	100.0%

Most respondents came from solo-parent households. This finding highlights the importance of supportive school and home environments in promoting learner motivation, resilience, and academic success.

Table 3

Profile of Third-Grade Pupils by Attendance Status

Attendance Category	Frequenc y(n=52)	Percent
Chronically Absent	22	42.3%
Not Chronically Absent	30	57.7%
Total	52	100.0%

Overall, the respondents were relatively balanced by gender, while most came from solo-parent households and were not chronically absent. These demographic characteristics provide important contextual information for understanding learner experiences and for planning instructional and support interventions within the school setting.

2. What was the mathematics performance of the third-grade pupils based on the i-Ready pretest and posttest scores?

Table 4

Descriptive Statistics for Pretest and Posttest Mathematics Scores

Descriptive Statistics	i-Ready Diagnostic Math-Pretest	i-Ready Diagnostic Math-Posttest
Mean	404.27	416.31
StDev	23.48	25.53
Minimum	350.00	361.00
Maximum	453.00	468.00

The i-Ready Diagnostic results showed a notable improvement in the mathematics performance of the third-grade pupils following the growth-mindset intervention. The mean score increased from 404.27 (SD = 23.48) on the pretest to 416.31 (SD = 25.53) on the posttest. The lowest score improved from 350.00 to 361.00, while the highest score increased from 453.00 to 468.00. The improvement in mathematics performance supports recent findings that growth-mindset interventions can positively influence academic achievement by encouraging persistence, resilience, and productive responses to challenges (Chen et al., 2024; Zhao et al., 2023). These findings suggest that students who view intelligence as developable are more likely to engage in sustained effort when encountering difficult mathematical tasks.

The findings suggest that growth-mindset strategies may serve as an effective complement to mathematics instruction by promoting persistence, engagement, and improved academic performance.

3. What is the performance level in mathematics of third-grade pupils in terms of pretest and posttest?

The pretest and posttest results showed that most of the third-grade pupils improved their mathematics performance after participating in the growth-mindset intervention. Before the intervention, the pupils' average score placed them below three grade levels in mathematics. After the intervention, the mean posttest score increased to 416.31, indicating improvement to approximately two grade levels below their chronological age. This suggests that the pupils became more prepared to learn and were better able to understand mathematical concepts with teacher guidance. Notably, among the 22 pupils identified as chronically absent, only seven did not improve their posttest scores.

As a result of the intervention, many pupils demonstrated greater persistence, engagement, and confidence when solving mathematical problems. They appeared more willing to learn from mistakes and apply mathematical concepts to meaningful situations. While individual progress varied, the overall improvement in scores suggests that growth-mindset strategies helped reduce learning gaps and supported pupils who were struggling academically. These findings are consistent with the studies of Yeager and Dweck (2020), who found that pupils who believe their abilities can be developed through effort show greater academic growth and resilience. Likewise, Dweck (2006) emphasized that learners with a growth mindset are more likely to embrace challenges, persist through difficulties, and view effort as an essential part of learning and achievement.

4. Is there a significant difference in the performance level in mathematics of third-grade pupils in terms of the pretest and posttest?

Table 5

Paired-Samples t Test Results

Paired Samples Statistics	Mean	StDev	t-value	p-value	Decision	Remarks
Pretest	404.27	23.48	-5.31	< .001	Reject Ho	Significant
Posttest	416.31	25.53				

Note: $p < .05$ indicates statistical significance

The results revealed a significant improvement in the mathematics performance of the third-grade pupils following the growth-mindset intervention. The mean score increased from 404.27 (SD = 23.48) in the pretest to 416.31 (SD = 25.53) in the posttest. The computed t-value of -5.31 and $p < .001$ led to the rejection of the null hypothesis, indicating that the improvement was statistically significant and not due to chance. These findings suggest that the intervention contributed positively to the pupils' mathematics achievement.

The results support the work of Dweck (2006), which emphasizes that students who believe their abilities can improve through effort tend to achieve higher academic outcomes. Similarly, Blackwell et al. (2007) found that growth-mindset interventions can improve mathematics performance, particularly when students face challenging tasks. The findings of this study indicate that integrating growth-mindset strategies into mathematics instruction can help pupils develop greater confidence, persistence, and academic success. The significant improvement in mathematics performance also highlights the role of school leaders in supporting growth mindset initiatives through instructional coaching, teacher professional development, and school-wide implementation of evidence-based motivational practices. School administrators may facilitate the sustainability of these interventions by providing resources, monitoring implementation, and fostering a culture that promotes learner resilience, persistence, and academic growth. The findings further suggest that growth mindset principles may be integrated into elementary mathematics curriculum implementation through reflective learning activities, goal-setting exercises, collaborative problem-solving tasks, and socio-emotional learning experiences that promote persistence and resilience.

5. Are there significant differences in growth mindset scores when pupils are grouped according to gender, family background, and attendance?

Table 6

Independent-Samples t-Test of Growth Mindset Scores by Attendance Status

Attendance Status	n	Mean	StDev	t-value	p-value	Decision	Remarks
Chronically Absent	22	33.77	3.12	-0.93	0.359	Do not reject H_0	Not Significant
Not Chronically Absent	30	34.53	2.64				

Note: $p < .05$ indicates statistical significance

The independent-samples t-test showed no significant difference in growth mindset scores when pupils were grouped according to attendance status. Pupils who were not chronically absent obtained a slightly higher mean score ($M = 34.53$, $SD = 2.64$) than pupils who were chronically absent ($M = 33.77$, $SD = 3.12$). However, the difference was not statistically significant, $t = -0.93$, $p = 0.359$. Therefore, the null hypothesis was not rejected, indicating that attendance status did not significantly influence pupils' growth mindset scores.

The findings suggest that growth mindset may be influenced more by classroom experiences, teacher feedback, and school culture than by demographic factors such as attendance. This supports the work of Dweck (2006), who emphasized the role of instructional practices in developing a growth mindset. Therefore, schools should continue promoting growth mindset practices through supportive teaching strategies and strong home-school partnerships.

Table 7

Independent-Samples t-Test of Growth Mindset Scores by Gender

Gender	n	Mean	StDev	t-value	p-value	Decision	Remarks
Male	25	33.36	2.91	-2.14	0.037	Reject H_0 .	Significant
Female	27	35.00	2.59				

Note: $p < .05$ indicates statistical significance

The independent-samples t-test revealed a significant difference in growth mindset scores when pupils were grouped according to gender. Female pupils obtained a higher mean score ($M = 35.00$, $SD = 2.59$) than male pupils ($M = 33.36$, $SD = 2.91$). The difference was statistically significant, $t = -2.14$, $p = .037$. Therefore, the null hypothesis was rejected, indicating that gender significantly influenced growth mindset scores in this sample.

These findings indicate that female pupils demonstrated significantly higher growth mindset scores than male pupils in this sample. Nevertheless, the results suggest that growth mindset can be developed among all learners through supportive classroom environments, constructive feedback, and opportunities for persistence and reflection. Consistent with Dweck (2006), growth mindset is shaped by learning experiences and instructional practices rather than fixed personal characteristics.

Table 8*Independent-Samples t-Test of Growth Mindset Scores by Family Background*

Family Background	n	Mean	StDev	t-value	p-value	Decision	Remarks
Solo	36	33.75	2.79	-1.80	0.082	Do not reject Ho	Not Significant
Both	16	35.25	2.77				

Note: $p < .05$ indicates statistical significance

The independent-samples t-test revealed no significant difference in growth mindset scores when pupils were grouped according to family background. Pupils from two-parent households obtained a slightly higher mean score ($M = 35.25$, $SD = 2.77$) than pupils from solo-parent households ($M = 33.75$, $SD = 2.79$). However, the difference was not statistically significant, $t = -1.80$, $p = .082$. Therefore, the null hypothesis was not rejected, indicating that family background did not significantly influence growth mindset scores. This finding suggests that family background does not significantly influence the development of a growth mindset among third-grade pupils. The result supports Dweck's (2006) view that growth mindset is shaped more by encouragement, feedback, and learning opportunities than by demographic characteristics. Although previous studies have linked family background to certain academic and socioemotional outcomes, the present study indicates that pupils from both solo-parent and two-parent households can develop similar levels of growth mindset when provided with positive support and meaningful learning experiences. These findings highlight the important role of teachers and schools in fostering perseverance, resilience, and a belief in effort-based success among all learners.

6. Based on the findings, what growth mindset program can be proposed?

The proposed Growth Mindset Development Program is presented in a condensed matrix format showing the program objectives, activities, responsible stakeholders, resources, monitoring procedures, and expected outcomes.

Table 9*Proposed Growth Mindset Development Program Matrix*

Program Component	Description
Goal	Improve mathematics achievement through the implementation of growth mindset practices among third-grade pupils.
Participants	Third-grade pupils, teachers, school administrators, and parents.
Activities	Growth mindset lessons, reflective journaling, goal-setting activities, effort-based feedback, and parent orientation workshops.
Timeline	One school year.
Persons Responsible	School principal, classroom teachers, and parents.
Resources Needed	Learning materials, reflective journals, instructional resources, and assessment data.
Monitoring and Evaluation	Quarterly progress reviews, classroom observations, and assessment of pupil performance and growth mindset indicators.
Expected Outcomes	Improved mathematics achievement, increased learner resilience, enhanced engagement, and stronger growth mindset beliefs.

The findings of the study revealed that the growth-mindset approach had a significant positive effect on the mathematics performance of third-grade pupils. The intervention helped pupils become more engaged in learning, develop greater resilience when facing academic challenges, and improve their overall performance in mathematics.

The results suggest that growth-mindset practices can be effectively integrated into classroom instruction and extended beyond the classroom through a collaborative program involving teachers, parents, and school administrators. Consistent support from school leaders is essential for the successful implementation of such programs, particularly through ongoing teacher training and professional development (Yeager & Dweck, 2020; Zhao et al., 2023). The findings also suggest that teacher education institutions may strengthen preservice and in-service teacher preparation by incorporating growth mindset pedagogy, learner motivation, and resilience-building instructional strategies into teacher training curricula. Furthermore, encouraging parental involvement can strengthen the impact of growth-mindset practices, as family support plays an important role in students' motivation and academic success. Overall, the study reveals the importance of a collaborative approach in fostering perseverance, resilience, and improved academic outcomes among third-grade pupils. The proposed growth mindset development program represents an innovative educational intervention because it extends mindset instruction beyond the classroom through collaboration among teachers, parents, and school administrators. This whole-school approach may strengthen the sustainability and effectiveness of mindset-based practices in elementary education.

The proposed Growth Mindset Development Program represents an innovative instructional and school-improvement initiative that combines mindset-based instruction, school-home collaboration, and data-informed monitoring of learner progress.

Conclusions

Based on the analysis and interpretation of the data, the following conclusions were drawn.

The third-grade pupils were composed of a nearly balanced number of male and female pupils, with the majority coming from solo-parent households and a substantial proportion classified as chronically absent. This demographic profile indicated that some learners faced socio-familial and attendance-related challenges that could potentially affect their educational experiences and academic performance.

The findings revealed that the integration of growth-mindset strategies into mathematics instruction resulted in a statistically significant improvement in pupils' mathematics performance, as evidenced by higher posttest scores compared with pretest scores. The results suggest that when pupils were encouraged to view mistakes as opportunities for learning and to believe that abilities could be developed through effort and persistence, they became more willing to engage with challenging mathematical tasks. These findings support the value of creating classroom environments that foster resilience, confidence, and positive attitudes toward learning.

The study further found that growth mindset outcomes differed significantly according to gender, with female pupils obtaining higher growth mindset scores than male pupils. No statistically significant differences were found according to family background and attendance. These findings suggest that growth mindset practices may be implemented effectively across diverse groups of learners while recognizing possible gender-related differences in mindset development.

The proposed Growth Mindset Development Program represents an innovative school-improvement strategy that promotes learner resilience, motivation, engagement, and academic success. The findings further highlight the importance of teacher professional development in growth-mindset pedagogy and suggest that school leaders may play a critical role in supporting school-wide implementation of mindset-based practices through instructional leadership, teacher capacity-building, and collaborative partnerships with parents.

The study demonstrated that integrating growth mindset strategies into elementary mathematics instruction contributed to improved learner performance, persistence, and engagement. The findings suggest that growth mindset practices may serve as an effective instructional innovation that supports curriculum implementation, socio-emotional learning, and learner achievement. The proposed growth mindset development program represents a school-improvement initiative that promotes collaboration among teachers, school leaders, and parents while supporting continuous professional development and positive educational outcomes.

Recommendations

Based on the conclusions of the study, the following recommendations are offered.

School administrators may support the institutionalization of a school-wide growth mindset development program by providing continuous teacher training and professional development to ensure that teaching staff remain competent, updated, and prepared to facilitate growth-mindset strategies across grade levels.

Teachers may consistently implement growth-mindset strategies within mathematics instruction, particularly for pupils who demonstrate low confidence or chronic absenteeism and may collaborate with parents and fellow teachers to ensure that pupils receive the full benefit of the program.

Curriculum developers may integrate growth mindset principles and reflective learning activities into elementary mathematics curricula.

Educational policymakers may consider incorporating growth mindset initiatives into school improvement and teacher development programs.

Teacher education institutions may strengthen preservice and in-service preparation through growth mindset and learner motivation training.

Parents may work collaboratively with schools and teachers to support the academic needs of their children by actively applying growth-mindset strategies at home, such as praising effort and persistence rather than focusing solely on outcomes.

Future researchers may conduct similar studies using larger and more diverse samples, control groups, or longitudinal designs to further validate the effectiveness of growth-mindset interventions among early elementary pupils and to examine their sustained effects over time.

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