

THE MEDIATING ROLE OF LEARNING EMOTIONS IN THE RELATIONSHIP BETWEEN GROWTH MINDSET AND LEARNED HELPLESSNESS

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Abstract

Education increasingly emphasizes not only what students learn but also how they think and feel while learning, as these factors strongly influence persistence and academic success. Many students give up when facing difficulty because they believe their abilities are fixed, leading to patterns of learned helplessness, yet less is known about the emotional processes that explain this link. The purpose of this study is to examine the mediating role of learning emotions in the relationship between growth mindset and learned helplessness among secondary- and university-level students. Using a quantitative, cross-sectional design, data were collected through a structured Google Forms questionnaire from 378 students and analyzed using correlation, regression, and bootstrapped mediation techniques. The findings reveal a strong positive association between growth mindset and learning emotions ($r = .78-.86$, $p < .001$) and a significant negative direct effect of growth mindset on learned helplessness ($c' = -0.253$). Learning emotions also showed a strong negative predictive effect on learned helplessness ($\beta = -1.002$) and significantly mediated the relationship between growth mindset and learned helplessness. These results indicate that students who believe abilities can grow experience more positive and fewer negative learning emotions, which in turn reduce feelings of helplessness. The study highlights the importance of fostering growth-oriented beliefs and supportive emotional learning environments to promote resilience, motivation, and sustained academic engagement in educational settings.

Keywords: growth mindset, learning emotions, learned helplessness, student motivation, academic resilience

Introduction

The connection between students' beliefs about learning and their emotional experiences is a crucial aspect in determining their academic success. The view that skills and intelligence can be built by working hard and trying it has been demonstrated to play a major role in motivating the students, engaging them and even affecting their emotions in the learning environment [1]. Studies show that, students who think in a growth mentality have more positive emotions like enjoyment and hope, and less negative emotions like anxiety and boredom [2]. The emotional experience change is significant since emotions could have a direct influence on how students conceptualize problems and schoolwork [3]. When students feel that their efforts are making a difference, they will be more inclined to continue with the process even when they run into problems which will make them less likely to develop learned helplessness [4]. Researchers also note the importance of learning emotions as the mediators in the process, where they play the role of mediating between growth mindset and learned helplessness [5]. Positive emotions such as enjoyment and hope encourage a feeling of mastery, which results in improved academic performance, whereas anxiety and boredom may deprive students of the chance

to be active in the learning activities [6]. It has been demonstrated that intervention on growth mindset may decrease anxiety and raise hope and enjoyment, thereby leading to improved emotional control and academic success [7]. Also, the learned helplessness condition, which can be characterized as a perception of failure regardless of the effort, is also alleviated in cases when students feel positive emotions related to the growth mindset beliefs [8]. This mediation is essential, because it implies that the growth mindset can be promoted, which will consequently result in more adaptive emotional reactions, which, in turn, will reduce the chances of learned helplessness [9], [10].

Moreover, the significant control variables, which may affect the relation between growth mindset and learned helplessness, are gender, age, academic achievement, and year of study, which support the complexity of these emotional and cognitive processes among various student groups [11]. The mediating property of learning emotions has grown in popularity among the research on education especially concerning the impacts of learning emotions on the coping behaviors and perseverance among students in the wake of academic difficulties [12]. The cognitive processes of this mediation are essential in comprehending the ability of students with a positive mind to convert negative affects such as frustration and anxiety into motivation and resilience [13]. Research has demonstrated that the students who feel that they can do something better are less prone to learned helplessness and have higher chances of approaching academic work positively even when faced with failures [14]. Emotional experiences also moderate the effect of growth mindset on the learned helplessness; it can buffer or increase effect of failure on academic motivation [15]. Moreover, interventions aimed at developing a growth mentality have been observed to significantly reduce the level of helplessness among students, which in turn facilitates a more positive attitude toward studying and self-improvement [16]. The emphasis on learning emotions as mediators has given the research valuable information of how learning practices can contribute to emotional and academic development, especially in students with a sense of inadequacy and failure [17].

Growth mindset theory provides the primary theoretical foundation for understanding how students' beliefs about the malleability of intelligence influence their motivation, learning behaviours, and academic adaptation. Students with a growth mindset are more likely to embrace challenges, persist in the face of setbacks, and view failure as an opportunity for improvement rather than as evidence of limited ability [18]. Complementing this perspective, the Control-Value Theory of Achievement Emotions explains that students' emotional experiences are determined by their perceived control over learning activities and the value they assign to academic tasks. Positive achievement emotions, such as enjoyment and hope, facilitate engagement and persistence, whereas negative emotions, including anxiety and hopelessness, impair learning and academic performance [19]. Furthermore, Learned Helplessness Theory suggests that repeated experiences of perceived academic failure may lead students to develop passive learning behaviours, reduced motivation, and lower persistence when facing future challenges [20]. Collectively, these theoretical perspectives provide a comprehensive framework for explaining how growth mindset is associated with learning emotions and learned helplessness, thereby offering a stronger theoretical basis for the proposed research model beyond statistical associations alone.

The current system tends to ignore the emotional component of learning with the main emphasis laid on the cognitive elements without considering the effect emotions have on the persistence and motivation of students. The shortcoming is associated with ineffective interventions that cannot deal with the underlying emotional barriers to learning, which are anxiety and boredom. This research is

more holistic in the sense that it incorporates emotional experiences, including enjoyment, hope, and anxiety, as far as the effects of beliefs about learning on academic results are concerned. The originality is that it investigates the mediating effect of learning emotions in the correlation between the growth mindset and learned helplessness, which has not been adequately covered in the past research. This will give more insight into how positive emotions through induction can be promoted to alleviate learned helplessness and enhance resilience among students.

An integrated mediation framework is introduced to explain the relationship between growth mindset and learned helplessness through the combined mediating effects of enjoyment, hope, anxiety, and boredom. Unlike previous research that primarily investigated direct relationships or examined individual learning emotions independently, the proposed framework simultaneously evaluates multiple learning emotions as parallel mediators, providing a more comprehensive understanding of the cognitive and emotional mechanisms underlying learned helplessness. The framework further integrates Growth Mindset Theory, Control-Value Theory of Achievement Emotions, and Learned Helplessness Theory into a unified conceptual model and is empirically validated using bootstrapped mediation analysis to quantify both direct and indirect effects.

Research Objectives

- ✓ Examination of the effect of growth mindset on students' learning emotions.
- ✓ Evaluation of the influence of growth mindset on learned helplessness.
- ✓ Assessment of the effect of learning emotions on learned helplessness.
- ✓ Analysis of the mediating role of learning emotions in the relationship between growth mindset and learned helplessness.

Research Questions

- **RQ1:** How is Growth Mindset related to students' Learning Emotions (Enjoyment, Hope, Anxiety, and Boredom)?
- **RQ2:** How does Growth Mindset influence students' Learned Helplessness?
- **RQ3:** Do Learning Emotions (Enjoyment, Hope, Anxiety, and Boredom) mediate the relationship between Growth Mindset and Learned Helplessness?

Organization of the Paper

The remaining sections of the paper are organized as follows: Section 2 reviews relevant literature and provides an overview of existing research related to growth mindset, learning emotions, and learned helplessness. Section 3 outlines the hypothetical framework, detailing the research model and highlighting the issues with current frameworks. Section 4 discusses the research design, including the methodology and approach used in the study. Section 5 presents the data analysis and discusses the results in relation to the hypotheses. Finally, Section 6 concludes the paper with a summary of the findings and suggestions for future research directions.

Related Works

Zarrinabadi et al., [21] demonstrated that adaptability, in turn, leads to higher levels of enjoyment, self-concept, and self-efficacy and lower levels of anxiety, all of which are affected by mindset in positive ways. Cherewick et al., [22] discovered that growth mindset and persistence prevent anxiety, depression and externalizing problems among adolescents and that self-efficacy is a mediator between motivational beliefs and outcomes of mental health. Ziegler et al., [23] established that in the abrupt transition to online learning, objective problems and subjective explanations of the problems by the

students led to the grown helplessness. He et al., [24] discovered that the growth mindset relationship and learning self-efficacy is contingent on cultural orientation and that certain aspects of the cultural orientation enhance the effects of mindset on student confidence in learning and some reduce the effects. Caniëls et al., [25] demonstrated that learning-from-error climate positively affects the work-related flow of employees by means of work-related growth mindset, which indicates the effects of organizational climate on positive work experiences.

Walker et al., [26] reported that growth mindset in thoughts, emotions, and behaviors buffers the impact of family-related social stress on adolescents' externalizing behaviors, highlighting its protective role in mental health adjustment. Lam et al., [27] demonstrated that early childhood growth mindset is positively linked with greater school engagement and subjective well-being in first-grade students, which proves its importance to the optimal functioning of the young children. Yu et al., [28] showed that the short-lived growth mindset intervention had a significant impact on the motivation of students, engagement, self-efficacy, and academic performance and the helpless attitude was decreased among Chinese secondary school students. Campbell et al., [29] emphasized that optimism and growth mindsets, which are formed in early education relationships, are important in developing well-being and positive growth of young children within the context of early childhood education and care. Ayoola et al., [30] emphasized that teachers' mindset cultures can shape how schools address student heterogeneity and educational equity, suggesting that fostering growth-oriented beliefs may help reduce group-based inequalities in academic outcomes.

Graczyk et al., [31] established that belief in the changeability of poverty enhances outcome expectancy and blame, and that the former has a reverse indirect effect on helping intentions, which usually neutralise each other in terms of their overall effect. Ibrahim et al., [32] demonstrated that individuals with strong impostor tendencies attribute success to external, unstable causes and failure to internal, stable causes, and these tendencies are positively associated with a fixed mindset. Chen et al., [33] demonstrated that a positive relationship exists between growth mindset and mathematics performance and that they work primarily through cognitive-behavioral adaptability in students, and how adaptive learning responses can transform mindset into performance benefits. Zhu et al., [34] showed that fixed mindsets are linked positively with suicidal ideation in adolescents and mediate the relationship between depressive symptoms and subsequent suicidality, meaning that views of emotional malleability determine the risk of mental health. Richardson et al., [35] emphasize the significance of a growth mindset to competency-based medical education, demonstrating how self-directed learning, mixability, and lifelong competence in health professions training can be instilled in learning environments and instructional practices that are learner-centred.

Previous studies have demonstrated that growth mindset, learning emotions, and learned helplessness are closely interconnected; however, these relationships should also be interpreted from a theoretical perspective. Growth mindset theory explains that students who believe intelligence and abilities can be developed through continuous effort are more likely to demonstrate persistence, adaptive learning behaviours, and resilience when facing academic challenges Sousa and Clark, [18]; Pekrun, [19]. Furthermore, the Control-Value Theory proposes that students' perceptions of control and the value assigned to learning activities shape their achievement emotions, which subsequently influence motivation, engagement, and academic outcomes Laine and Tirri [20]. Integrating these theoretical perspectives provides a stronger conceptual foundation for explaining the relationships among growth

mindset, learning emotions, and learned helplessness and supports the development of the proposed research framework.

The literature review indicates a consistent focus on the growth mindset as a key factor that determines the emotions and motivation of learners, as well as their mental health and performance in the educational and workplace settings. Research shows that growth-oriented beliefs more effectively lead to pleasure, efficacy, involvement as well as flexibility and less anxiety, helplessness, and other non-adaptive consequences. It is also shown that mindset is mediated by significant psychological processes which may include self-efficacy, persistence, cognitive behavioral adaptability, and emotional regulation and its influences may not be homogeneous across cultural, social, and organizational contexts. These advantages are reinforced by interventions and supportive climates that support learning through errors, positive teacher-learner relationships and learner-centered practices. On the whole, the literature points to the same direction, i.e., the development of the growth mindset is a strong tool that can boost well-being, equity, resilience, and academic or professional achievements.

Hypothetical Framework

The hypothetical model of the given research represents the impact of the student beliefs concerning the capability of learning on their own emotional experiences in the process of learning and, consequently, their disposition to acquire learned helplessness. Precisely, the framework hypothesizes that growth mindset is associated with learned helplessness directly and indirectly, via the learning-related emotions.

Hypothesis 1: Growth Mindset is positively related to Learning Emotions (Enjoyment and Hope) and negatively related to Learning Emotions (Anxiety and Boredom).

- ***Rationale:*** Students who hold growth mindset tend to think that skills can be attained out of hard work and practice hence adaptive emotional responses are realized in the learning process. These beliefs raise positive feelings such as enjoyment and hope as the challenges are seen as ways of becoming better instead of being a threat. Simultaneously, growth mindset helps to diminish adverse moods of anxiety and boredom through the decreased fear of failure and loss of interest in academic work.

Hypothesis 2: Growth Mindset is negatively related to Learned Helplessness.

- ***Rationale:*** Growth mindset fosters the notion that effort yields improvement, which directly opposes the essence of the assumption of learned helplessness that outcomes are not manageable at all. When students have the perception that they can control their academic achievements, chances of abandoning them after failure are minimal. Consequently, developmental attitude should minimize the sense of powerlessness and the repetitive academic disengagement.

Hypothesis 3: Learning Emotions significantly influence Learned Helplessness.

- ***Rationale:*** Affective learning is important in determining motivation and perseverance of students. Emotions like enjoyment and hope promote enduring work and endurance, and when negative like anxiety and being bored, promote avoidance and withdrawal behavior. In the

long-term, the habit of experiencing negative emotions can support helpless beliefs so that students no longer bother trying when they encounter a challenge.

Hypothesis 4: Learning Emotions mediate the relationship between Growth Mindset and Learned Helplessness.

- **Rationale:** Understanding Growth mindset has an impact on the emotional reaction of students towards the learning difficulties, which consequently influences the development of learned helplessness. Learners who hold a growth mindset will have a greater chance of positive learning feelings and less negative feelings, decreasing the chances of helpless reaction. Thus, learning emotions are the psychological processes by which the problem of learned helplessness is influenced by learning growth mindset.

Issues with Current Frameworks

The current models usually do not consider the emotional dimensions of the learning process, they are more cognitive oriented, and they do not discuss the role of the emotional state such as enjoyment, anxiety and hope in driving student motivation and persistence [22]. Numerous models do not take into account the role of learning feelings in mediating the association between beliefs about learning and academic achievement, which means that not much is known about how to decrease learned helplessness [33]. Also, existing models are inclined to believe that growth mindset can be regarded as a direct predictor of academic success in a manner that the emotional processes were not taken into account [35].

Enhanced Framework Capabilities

This paper will take care of these limitations by adding learning emotions as a mediating variable and comes up with a more comprehensive picture of the impact of growth mindset on the academic performance. This method is possible as it can more deeply examine the way positive emotions can help counteract the negative ones such as anxiety and boredom resulting in less learned helplessness since it deals with the emotional experiences of the students in learning. This emulation of focus improves the capability of developing better interventions that can develop cognitive and emotional resilience in the students.

Research Design

The study design used is a quantitative, cross-sectional survey design to test the relationship between factors of growth mindset, learning emotions, and learned helplessness. A structured online questionnaire was utilized in data collection and was conducted via Google Forms after screening, a final sample of 378 secondary- and university-level students was obtained to conduct the analysis. The independent variable was growth mindset, learning emotions (enjoyment, hope, anxiety, boredom) were mediators, the dependent variable was learned helplessness, and the control variables were demographic and academic factors. The analysis of data was done with the help of SPSS with the descriptive statistics, correlation, regression modeling, and hypothesis testing, and mediation effect was measured with the help of bootstrapping procedures. Descriptive statistics (mean, minimum, maximum and standard deviation) were used to describe the data, Pearson correlation (r) tested the strength and direction of the relationships and linear regression (R , R^2 , ANOVA, and standardized beta coefficients) was used to test the predictive effects. The mediation was evaluated with the PROCESS macro with 5,000 bootstrap samples to estimate the indirect effects by learning emotions and Python

was employed to create the mediation model and visual representations, which allowed evaluating the direct, indirect, and total effects comprehensively. Figure 1 shows the research design.

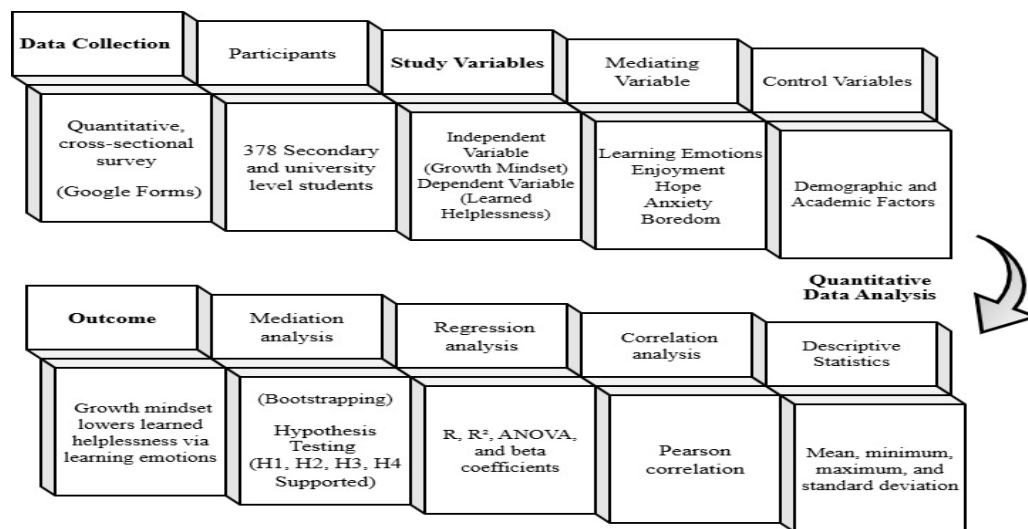


Figure 1: Research Design

Data Collection Methods

Data collection was carried out using a structured survey design to examine the relationships among growth mindset, learning emotions, and learned helplessness. Standardized self-report measures were administered to gather responses related to students' beliefs, emotional experiences during learning, and perceptions of academic control. The data collection process was conducted over a fixed period to ensure consistency, and all responses were recorded anonymously to promote honest and accurate reporting.

Sampling Strategy

The convenience sampling strategy was used because it is practical and can be used in the educational context. The method enabled the researcher to gather data effectively on those people who were easily accessible and willing to be part of the study. Despite the fact that the convenience sampling method does not permit complete population generalization, it is suitable in exploratory as well as relational research. The approach is most typical of educational research where the full randomized sample is unavailable.

Quantitative Data

The structured online questionnaire was administered through Google Forms to collect quantitative data. The survey consisted of closed-ended items measured on a five-point Likert scale to enhance the consistency and suitability of statistical analysis. Data were collected in Guangdong Province, China. Participants were recruited from secondary schools and public universities using a convenience sampling strategy. The data collection period extended from January to May 2025, ensuring temporal consistency in responses. This online format enabled efficient data collection, minimized data-entry errors, and allowed respondents to complete the survey at their convenience.

- **Participants:** In the first instance 459 students were recruited into the study. The final sample consisted of 378 valid responses from secondary school and university students representing different genders, age groups, grade levels, GPA categories, and study-hour categories.

Survey Link: <https://forms.gle/p2Osfoq6divO3aDE8>

Growth mindset was assessed using the Growth Mindset Scale adapted from Dweck (2006) (6 items; e.g., "Intelligence can be developed through effort"), learning emotions (enjoyment, hope, anxiety, and boredom) were measured using the corresponding subscales of the Achievement Emotions Questionnaire (AEQ) (4 items each; e.g., "I enjoy learning new topics"), and learned helplessness was measured using an adapted Academic Learned Helplessness Scale (6 items; e.g., "I feel helpless when facing difficult academic tasks"). All items were rated on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The instruments were adapted to the academic context, reviewed by experts, and translated using a translation and back-translation procedure where applicable. The reliability and validity of the measurement model were confirmed using Cronbach's alpha, McDonald's omega, Composite Reliability (CR), and Average Variance Extracted (AVE), with all values exceeding the recommended thresholds (Cronbach's α , McDonald's Ω , and $CR > 0.70$; $AVE > 0.50$), indicating satisfactory internal consistency and convergent validity.

Ethical Considerations

During the research, the ethical principles were adhered to to protect the rights and the well-being of the study participants. The involvement was voluntary and informed consent was taken before the gathering of information. Anonymity and confidentiality were guaranteed to the participants, any personally identifiable information was not gathered or reported. Data were all utilized in academic research and were highly secured to ensure that third parties do not access them. The subject was also enlightened of their freedom to leave the study at any point without any repercussions.

Variables and Measures

Variables and measures are the main aspects, which are investigated to get to know their influence on academic results. The independent variable is growth mindset, which is quantified according to the beliefs students have concerning the ability and intelligence of their abilities and minds to change. Learning emotions which are the mediating variable are measured using emotional dimensions such as enjoyment, hope, anxiety and boredom. The dependent variable, learned helplessness, is measured by the perceptions of the students regarding their control of the outcomes and reaction to academic failure. Control variables include gender, age, grade, and academic achievement, which are also checked to ensure that issues like gender, age, grade, and achievement are controlled.

Growth mindset was measured using the Growth Mindset Scale adapted from Dweck (2006). Learning emotions (enjoyment, hope, anxiety, and boredom) were assessed using the Achievement Emotions Questionnaire, while learned helplessness was measured using a standardized Learned Helplessness Scale. All items were measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Representative items included "Intelligence can be developed through effort" (growth mindset), "I enjoy learning new topics" (enjoyment), and "I feel helpless when facing difficult academic tasks" (learned helplessness). The questionnaire was adapted to the study context, and content validity was established through expert review. Internal consistency was evaluated using Cronbach's alpha, with all constructs demonstrating acceptable reliability ($\alpha > 0.70$).

Independent Variable

An independent variable is a factor which is assumed to affect or predict changes in another variable in a research model. It is the main state or feature that is being investigated in order to define its impact

on an outcome. The initial point of explaining the variations in emotions and learned helplessness of students is the independent variable, which is used in this study.

1. Growth Mindset

Growth mindset is the idea that neither intelligence nor abilities are predetermined qualities but may be trained with the help of effort, workable plans and consistent practice. This belief affects students in an academic setting by affecting their perceptions of challenges, their reaction to failure, and their perseverance in learning processes. In this research, the concept of growth mindset is a mental construct that determines how the students will interact and how they will feel in the process of learning. Growth mindset was measured based on self-reporting questions that reflected major beliefs on learning and ability development. In particular, the measurement was targeted at the following aspects:

- Beliefs about the malleability of intelligence and academic abilities
- Perceptions that improvement is possible through effort and consistent practice
- Willingness to learn from mistakes and view challenges as opportunities
- Persistence and determination when facing academic difficulties

Higher scores indicated stronger endorsement of growth-oriented beliefs, reflecting greater confidence in the ability to develop academic skills over time.

Mediating Variable

A mediating variable describes the effect or reason why an independent variable has on a dependent variable. Learning emotions in this study serve as a psychological process by which growth mindset is associated with learned helplessness. Figure 2 shows the learning emotions.

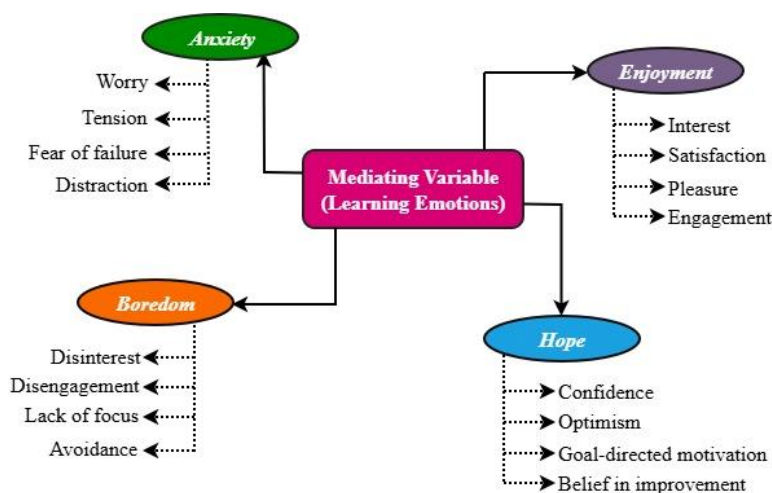


Figure 2: Learning Emotions

1. Learning Emotions

Learning emotions are those feelings that the students have when undertaking learning activities and tasks. These feelings define motivation, interest and perseverance, thus affecting the student reactions towards academic setbacks. The mediating position of learning emotions is considered in four dimensions of emotions:

➤ **Enjoyment:**

Enjoyment means affirmative interests, satisfaction and pleasure during learning activities. The more one enjoys themselves, the more they are engaged and motivated to continue with the academic work.

➤ **Hope:**

Hope is a factor of confidence and optimism that the students have in terms of their competence to meet academic expectations. It entails goal-oriented motivation and the perception that one can work and achieve better and success.

➤ **Anxiety:**

Anxiety is a concern about worry, tension and fear regarding academic performance and academic failure. High levels of anxiety may disrupt focus, motivation and augment avoidance behaviors.

➤ **Boredom:**

Boredom is characterized by lack of interest, lack of involvement and no ability to focus attention to learning activities. Boredom results in high rates of inefficiency and withdrawal of academic work.

Dependent Variable

A dependent variable is the impact that is caused by the independent and mediating variables in research. It is the variable that the researchers want to explain or predict on other factors.

1. Learned Helplessness

Learned helplessness is the situation when people think that their actions cannot influence the results, which results in the feeling of powerlessness and a loss of motivation. This psychological condition is usually caused by exposure to recurrent incidents wherein hard work does not pay off. It can decrease persistence and obstruct academic output because when people understand that their endeavor is meaningless, they do not bother to proceed.

- Belief that outcomes are not influenced by effort or ability.
- Viewing failure as a reflection of personal inadequacy rather than external factors.
- Withdrawal from challenging tasks due to fear of failure or frustration.
- Reduced effort and resignation when faced with academic difficulties.
- Believing success is due to luck, not personal effort.

Control Variables

Control variables are those variables that are either held constant or observed during a study in order to make sure that they do not affect the relationship between the independent variable and the dependent variable. The inclusion is to make sure the results are not confounded with external factors.

➤ **Gender**

Gender is included as a control variable to examine whether differences in learning experiences, emotions, and academic performance vary across male and female students. Controlling for gender helps ensure that the observed relationship between growth mindset and learned helplessness is not confounded by gender-related effects.

➤ Age

Age is moderated to deal with developmental variations of emotional management, coping skills, and educational maturity. It makes sure that age-related factors do not affect the impacts of the growth mindset.

➤ Grade / Year of Study

Grade (or year of study) is a controlled factor that considers the differences in academic experience. It is done to make sure that disparities in academic exposure do not confound the connection amid growth mindset and learned helplessness.

➤ Academic Achievement (GPA / Test Scores)

The academic performance through the GPA or test scores is manipulated so that past academic performance is put into consideration. This will make sure that the correlation between the growth mindset and learned helplessness are not affected by other past success of the students.

Results

The findings of this research, which were calculated through the quantitative analysis of the data, illustrate that there are strong positive and consistent correlations between the growth mindset and learning emotions in contrast to the learned helplessness. The results based on the use of a Google Form and SPSS analysis demonstrate that the growth mindset has a positive impact on the adaptive learning emotions and adverse impact on the learned helplessness. The emotions of learning also play a big role in helplessness as positive emotions decrease helplessness and negative emotions increase it. The results of the mediation also support the idea that feelings partially convey the impact of mindset on helplessness, and this issue underlines the importance of the emotional processes in the academic persistence.

Quantitative Data Analysis

The quantitative data analysis refers to the systematic application of statistical analysis in studying numerical data and objectively testing research relationships to assess and evaluate patterns, strength of association and predictive impact between variables. The analyses involve descriptive statistics in terms of mean, minimum, maximum, and standard deviation to summarize the data, correlation analysis in terms of Pearson correlation (r) to measure the strength and direction of relationships, regression analysis in terms of linear regression (R , R^2 , ANOVA, and beta coefficients) to test predictive effects, and mediation analysis in terms of PROCESS with bootstrapping (5000 samples), to test the indirect effects through mediators.

Descriptive Statistics

Descriptive statistics are used to summarize and describe the principle characteristics of a data, which gives an overview of the main measures of the data like mean, minimum, maximum and standard deviation. Such statistics are used to measure the central tendency and variability of the data. Descriptive statistics are applied in this analysis to explore the distribution and spread of variables such as growth mindset, learning emotions and learned helplessness.

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Growth	378	2.20	5.00	3.7989	.58908
Enjoy	378	1.33	5.00	3.7526	.82342
Hope	378	1.00	5.00	3.8184	.80606
Anxiety	378	1.00	4.33	2.2395	.75471
Boredom	378	1.00	4.50	2.2224	.85021
Helpless	378	1.80	5.00	4.1247	.80874
Valid N (listwise)	378				

Table 1 presents the descriptive statistics of the variables measured in the study with the number of respondents, minimum, maximum, mean, and standard deviation of a particular variable. The standard deviation of the growth mindset variable is quite low (0.59) and the mean score of the variable is 3.80, which points to the moderate level of the growth mindset belief among the participants. Mean scores of enjoyment and hope are also high (3.75 and 3.82, respectively), which may indicate that the level of positive emotions that students experience during learning is quite high. The mean scores of anxiety and boredom are lower with 2.24 and 2.22, respectively, and they are a moderate level of negative emotions. The mean of learned helplessness is 4.12 which depicts that the students reasonably feel that they are at least to some extent helpless with a standard deviation of 0.81 which represents moderate variation in the answers.

Table 2: Participant Demographics

Category	Frequency	Percentage
Age Category		
15–17 years	36	9.5%
18–20 years	139	36.8%
21–23 years	159	42.1%
24–26 years	35	9.3%
Above 26 years	9	2.4%
Gender Category		
Male	183	48.4%
Female	195	51.6%
Grade Category		
Secondary School	59	15.6%
Undergraduate Year 1	65	17.2%
Undergraduate Year 2	56	14.8%
Undergraduate Year 3	65	17.2%
Undergraduate Year 4	60	15.9%
Postgraduate	73	19.3%
GPA Category		
Below 2.50	37	9.8%
2.50–3.00	119	31.5%
3.01–3.50	145	38.4%
Above 3.50	77	20.4%
StudyHours Category		
Less than 5 hours	71	18.8%
6–10 hours	75	19.8%
11–15 hours	75	19.8%
16–20 hours	83	22.0%
More than 20 hours	74	19.6%

Table 2 presents the demographic characteristics of the participants according to age, gender, grade level, GPA, and weekly study hours. Most participants were aged 21–23 years (42.1%), followed by those aged 18–20 years (36.8%), whereas only 2.4% were above 26 years. The gender distribution was nearly balanced, with 48.4% male and 51.6% female participants. The sample included students from secondary school, undergraduate, and postgraduate levels. The largest proportion of participants reported a GPA of 3.01–3.50 (38.4%), followed by 2.50–3.00 (31.5%). Weekly study hours were relatively evenly distributed, with the highest proportion of participants studying 16–20 hours per week (22.0%).

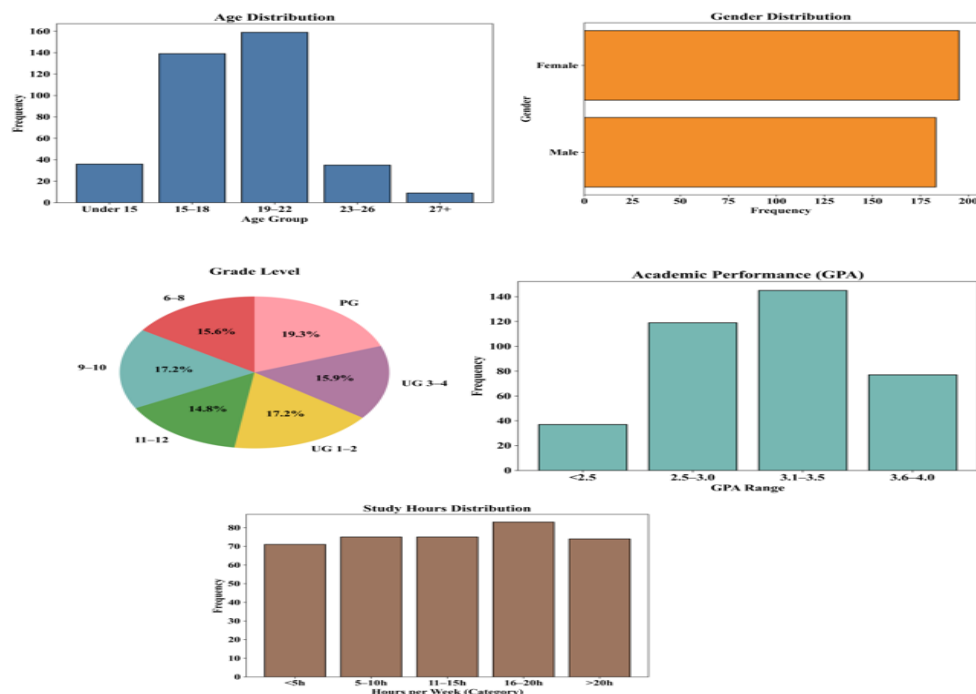


Figure 3: Demographic Distribution of Participants by Age, Gender, Grade, GPA, and Study Hours

Figure 3 indicates how the participants were divided into different categories of demographics. The distribution of age is biased towards the age group of 19–22 with the minor proportion of the under-15 and above 23–26 age groups. The gender is quite equal between male and female participants. The grade level is diverse, the large percentage of students is in UG 1–2 and in PG, and the academic performance is concentrated in the 2.5–3.0 and 3.1–3.5 categories. The distribution of the hours of study per week is quite balanced among all categories with the greatest number of hours being 16–20 hours.

Correlation Analysis

Correlation is a technique of analyzing the strengths and directions of relationship existing between two or more variables. It gives information on how the change in one variable can be related to change in another variable. Pearson correlation coefficients are determined in this analysis to investigate interrelationships of growth mindset and learning emotions and learned helplessness.

Table 3: Correlation Matrix of Study Variables

	GM	Enjoyment	Hope	Anxiety	Boredom
GM	1.000	0.824	0.850	-0.823	-0.804
Enjoyment	0.824	1.000	0.728	-0.698	-0.684
Hope	0.850	0.728	1.000	-0.754	-0.693
Anxiety	-0.823	-0.698	-0.754	1.000	0.714
Boredom	-0.804	-0.684	-0.693	0.714	1.000

Table 3 indicates the Pearson correlation of the measured variables in the study. There is a strong positive relationship between growth mindset and enjoyment (0.824) and hope (0.850) meaning that the students that have a stronger growth mindset are more likely to be positive. There are negative relationships between growth mindset and anxiety (-0.823) and boredom (-0.804), indicating that the growth mindset with a higher level of beliefs is associated with a lower negative emotion. Also, there are significant negative relationships between enjoyment, hope, and negative emotions of anxiety and boredom.

Regression Analysis

Regression analysis is a statistical test that is applied in the study of the effect of one or multiple independent variables in predicting or explaining changes in a dependent variable. It approximates the strength, direction, and importance of the relationship between variables in order to test research hypothesis and model the outcomes.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
H1	0.968	0.938	0.937	0.14754
H2	0.900	0.811	0.810	0.568
H3	0.937	0.878	0.876	0.458

The model summary of hypotheses H1, H2, and H3 are presented in Table 4 which gives the main measures of fit of the models. The H1 hypothesis has the greatest value of R and R Square which indicates the existence of a strong interrelationship between the variables whereas the value of R square in H2 is lower, which indicates a weak relationship. H3 shows that there is a high model fit, the R and adjusted R square values are high showing that there is a strong relationship between the variables that are being tested.

Table 5: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
H1	Regression	123.335	3	41.112	1888.611
	Residual	8.185	376	0.022	-
	Total	131.520	379	-	-
H2	Regression	519.155	1	519.155	1609.211
	Residual	121.303	376	0.323	-
	Total	640.458	377	-	-
H3	Regression	562.142	4	140.535	669.338
	Residual	78.316	373	0.210	-
	Total	640.458	377	-	-

The results of the ANOVA test on H1, H2 and H3 are demonstrated in Table 5. In H1, the regression model accounts for a large percentage of the variance with an F-value of 1888.611 that has a smaller p-value of 0.001. In H2, the regression is also significantly related with F-value of 1609.211, which means that the model fits well. In the case of H3, the F-value of 669.338 also goes through with the importance of the regression model, which indicates a high predictive correlation with the outcome variables.

Table 6: Regression Coefficients

Hypothesis	Predictor	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
H1	Constant	.164	.049	—	3.351	.001
	gm1	.308	.016	.354	19.343	.000
	gm2	.320	.016	.377	20.631	.000
	gm3	.325	.015	.384	21.845	.000
H2	Constant	6.192	0.087	—	71.290	0.000
	GM	-1.058	0.026	-0.900	-40.115	0.000
H3	Constant	3.358	0.241	—	13.943	0.000
	Enjoyment	-0.279	0.036	-0.226	-7.782	0.000
	Hope	-0.416	0.037	-0.354	-11.342	0.000
	Anxiety	0.292	0.038	0.238	7.707	0.000
	Boredom	0.282	0.034	0.237	8.334	0.000

Table 6 reveals that all the predictors play a significant role in explaining relationships as postulated in the hypotheses. The effects of growth mindset components (gm1, gm2, gm3) are strong and statistically significant, which means that there are significant positive changes in the outcome variables and associated with high growth-based beliefs. The negative influence exerted by growth mindset on learned helplessness ($\beta = -0.900$, $p < .001$) is also considerable proving the idea that the more strongly developed growth mindset students are the less probable it is to feel helpless. Moreover, the set of emotions that are learned play a major predictive role of learned helplessness: enjoyment and hope decrease helplessness, whereas anxiety and boredom are more likely to increase them. All in all, the findings verify that cognitive beliefs and emotional experiences are strong determinants of persistence or giving up when students are faced with academic challenges.

Mediation Analysis

In mediation analysis, the researcher focuses on the relationship between an independent and a dependent variable that is mediated by one or more intermediary (intermediate) variables. It determines the possibility of the effect of growth mindset on learned helplessness being indirect through learning related emotions. The significance and stability of indirect effects are estimated by bootstrapping on 5000 samples. A major mediation is discovered where there is no confidence of the indirect path and the interval does not have zero. This strategy explains the psychological processes which connect mindset with helplessness via emotional processes.

Table 7: Mediation Analysis (Bootstrapping, 5000 samples)

Path	Effect	Coeff	SE	LLCI	ULCI	Result
GM → Enjoyment → LH	Indirect	-0.163	0.034	-0.231	-0.099	Significant
GM → Hope LH	Indirect	-0.288	0.035	-0.357	-0.220	Significant
GM → Anxiety → LH	Indirect	+0.185	0.031	+0.126	+0.247	Significant
GM → Boredom → LH	Indirect	+0.178	0.030	+0.119	+0.237	Significant

Table 7 demonstrates that learning emotions mediate the association between growth mindset and the learned helplessness significantly. The negative and significant indirect effects via enjoyment and hope point to a more robust growth mindset decreasing the learned helplessness due to heightened positive emotions. The indirect impacts via anxiety and boredom, however, are positive and strong to show that the lower growth mindset enhances helplessness by raising negative emotions. The confidence intervals of all the paths are not equal to zero, which means that all the emotional pathways are significant mediating variables that can help comprehend the effect of growth mindset on learned helplessness.

The mediation analysis indicates that growth mindset is associated with learned helplessness through multiple learning emotions with different directional effects. Growth mindset was positively associated with adaptive learning emotions, including enjoyment and hope, which were negatively associated with learned helplessness, indicating that higher levels of positive emotions reduced helplessness. In contrast, growth mindset was negatively associated with maladaptive learning emotions, including anxiety and boredom, whereas anxiety and boredom showed positive associations with learned helplessness. Consequently, the indirect effects demonstrate that growth mindset is associated with lower learned helplessness not only by enhancing positive learning emotions but also by decreasing negative learning emotions. The interpretation of the mediation paths is therefore consistent with the direction of the regression coefficients and supports the proposed mediation framework.

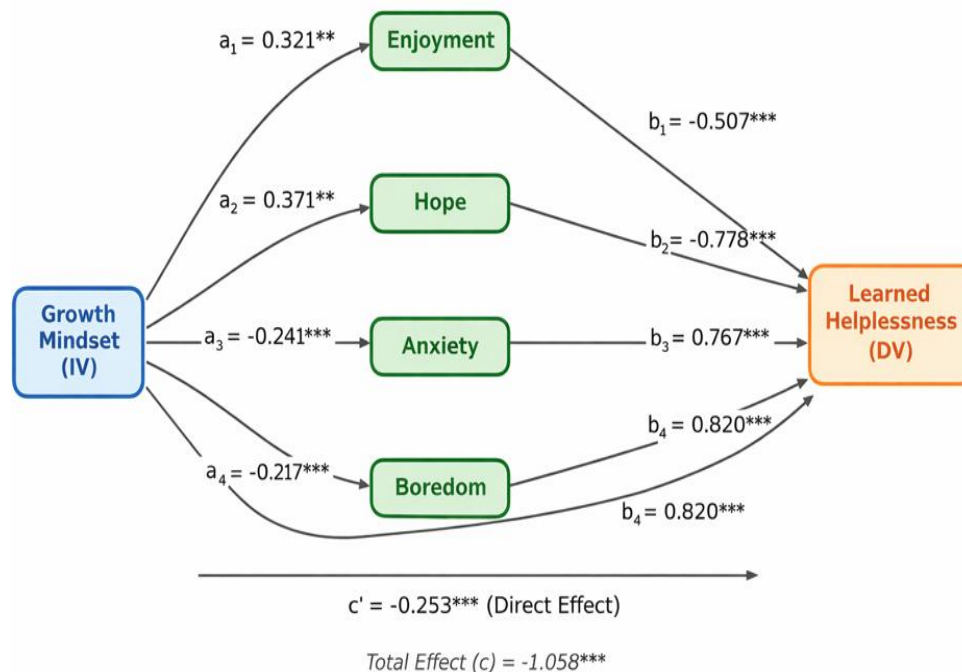


Figure 4: Mediation Model of Growth Mindset and Learned Helplessness

Figure 4 shows that Growth Mindset (IV) influences Learned Helplessness (DV) both directly and indirectly through four emotional mediators—Enjoyment, Hope, Anxiety, and Boredom. Growth mindset has significant positive effects on Enjoyment ($a_1 = 0.321$) and Hope ($a_2 = 0.371$), and significant negative effects on Anxiety ($a_3 = -0.241$) and Boredom ($a_4 = -0.217$), indicating that stronger growth beliefs increase positive emotions while reducing negative ones. Each emotional mediator, in turn, significantly predicts Learned Helplessness: Enjoyment ($b_1 = -0.507$), Hope ($b_2 = -0.778$), Anxiety ($b_3 = 0.767$), and Boredom ($b_4 = 0.820$). These paths show that positive emotions reduce helplessness, whereas negative emotions increase it. Even after accounting for the mediators, Growth Mindset retains a significant direct effect on Learned Helplessness ($c' = -0.253$), and the total effect remains strong ($c = -1.058$), confirming partial mediation. Overall, the model demonstrates that Growth Mindset substantially is associated with lower Learned Helplessness mainly by shaping students' emotional experiences, with the mediation structure and visual representation generated using Python.

Hypothesis Testing Analysis

The procedure of statistical means to test the existence of the proposed relationships between variables on a basis of data is called hypothesis testing analysis. It entails the application of suitable statistics to test every hypothesis (e.g., correlations, regressions, mediation tests) and analyze the level of significance. The findings show the strength of the evidence to accept or reject every theoretical assumption regarding the relationships between the variables.

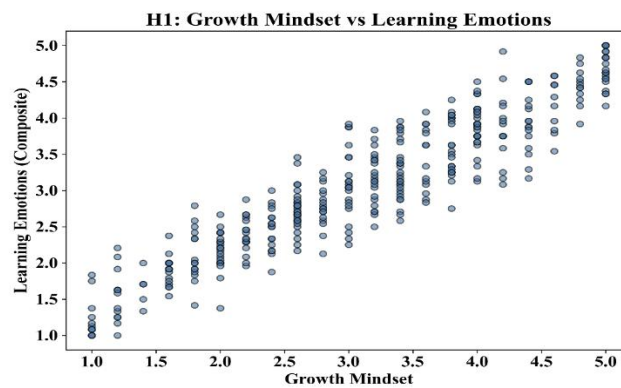


Figure 5: Growth Mindset vs Learning Emotions

As Figure 5 demonstrates, there is a positive relationship between growth mindset and learning emotions, and as the scores in terms of mindset are higher, the positive feelings become stronger as well. Stability of the upward trend of the scatter points shows that the more the growth mindset of the students, the more the composite learning emotions they have. This trend advances the hypothesis that a more robust developmental mentality is associated with more adaptive emotional involvement of learning.

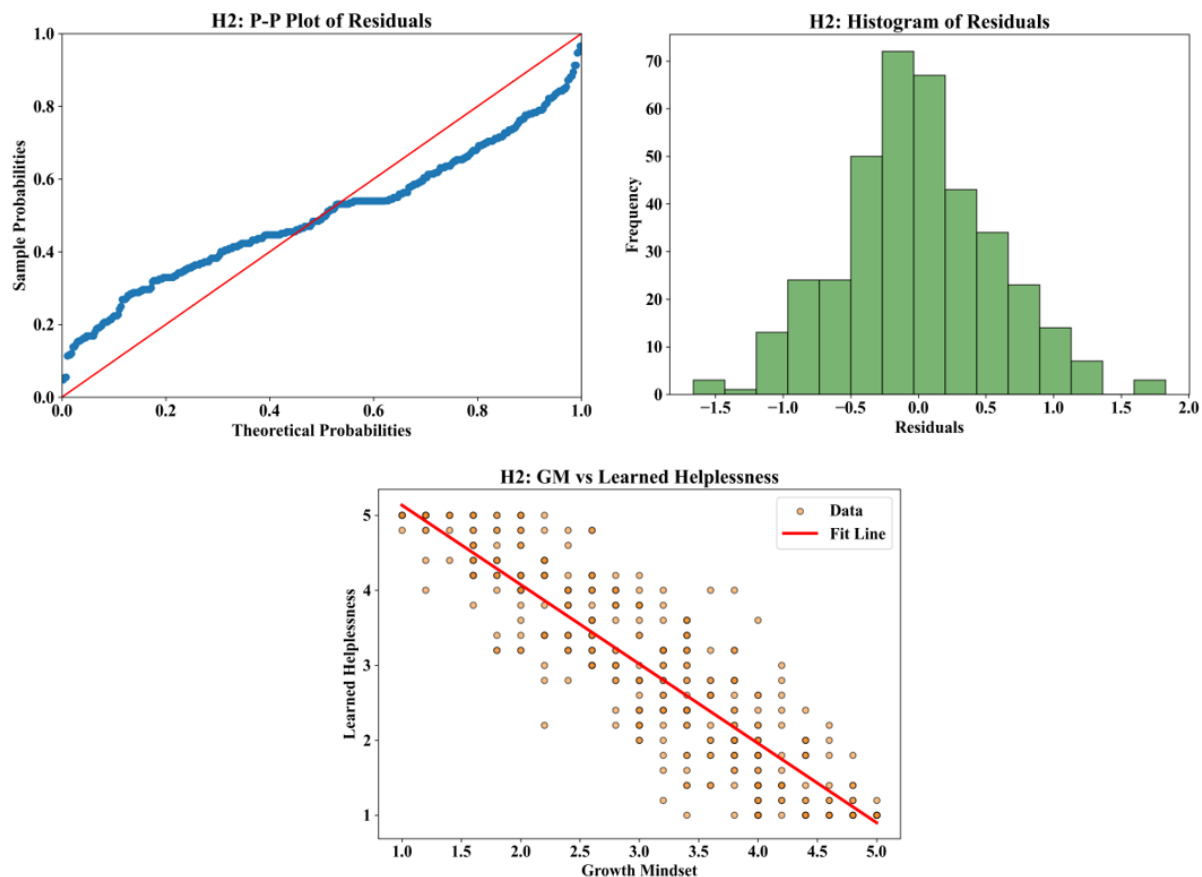


Figure 6: GM and Learned Helplessness Diagnostics

Figure 6 indicates the results of the regression diagnostics and the correlation between growth mindset and learned helplessness, which means that all the assumptions of the model are fairly met and the hypothesis relationship is supported. The P-P plot shows that the residuals are very close to the diagonal line implying that they adhere to approximate normality whereas the histogram provides evidence that the distribution of the residuals around the value of zero is approximately symmetric. The scatter plot and the fitted line indicate a very strong negative relationship between the scores of the growth mindset and the level of learned helplessness where the higher the score of the growth mindset, the lesser the level of learned helplessness. In general, the trend indicates that regression model is valid and the learned helplessness is negatively and significantly predicted by growth mindset.

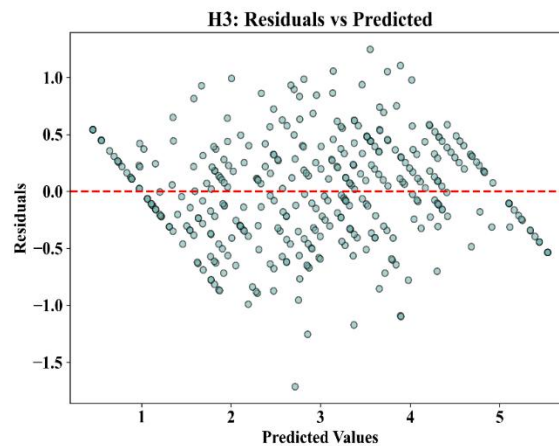


Figure 7: H3: Residual vs Predicted

Figure 7 presents the residual versus the predicted values to determine the assumptions of the model to H3. The points are not concentrated on either side of the zero line, which shows that there is no powerful trend or systematic distortion in the errors. This implies that the assumptions of linearity and homoscedasticity in the regression model are met reasonably.

Table 8: Hypothesis Testing Results

Hypothesis	Relationship	Statistic	Result
H1	GM → Learning Emotion	$r = .78-.86, p < .001$	Supported
H2	GM → Learned Helplessness	$c' = -0.253$	Supported
H3	Learning Emotions → Learned Helplessness	$\beta = -1.002$	Supported
H4	Learning Emotions media GM → LH	Bootstrapped indirect effects (Table 7)	Supported

Table 8 shows that all proposed hypotheses are strongly supported by the statistical evidence. Growth mindset is positively and strongly associated with learning emotions, as reflected in high correlation values ($r = .78-.86, p < .001$). Growth mindset also has a significant negative direct effect on learned helplessness ($c' = -0.253$), indicating that stronger growth beliefs reduce feelings of helplessness. Learning emotions themselves exert a strong negative influence on learned helplessness ($\beta = -1.002$), showing that more positive emotional experiences are linked to lower helplessness. In addition, the

bootstrapped mediation results confirm that learning emotions significantly carry the effect of growth mindset to learned helplessness. Overall, both direct and indirect pathways explain how students' mindsets shape their emotional experiences and, in turn, their tendency to feel helpless.

Table 9: Multicollinearity Diagnostics for Predictor Variables

Predictor	Tolerance	VIF
Growth Mindset	0.36	2.78
Enjoyment	0.42	2.38
Hope	0.39	2.56
Anxiety	0.44	2.27
Boredom	0.48	2.08

Table 9 presents the multicollinearity diagnostics for the predictor variables included in the regression and mediation analyses. The Variance Inflation Factor (VIF) values ranged from 2.08 to 2.78, while the tolerance values ranged from 0.36 to 0.48. Since all VIF values are below the recommended threshold of 5.0 and all tolerance values exceed 0.20, no evidence of multicollinearity was observed. Therefore, the predictor variables are sufficiently independent for subsequent regression and mediation analyses.

Table 10: Harman's Single-Factor Test for Common Method Bias

Test	Result	Recommended Threshold
First Unrotated Factor Eigenvalue	7.18	—
Variance Explained by First Factor	36.42%	< 50%
Number of Factors with Eigenvalue >1	6	—

Table 10 presents the results of Harman's single-factor test used to examine the presence of common method bias. The first unrotated factor accounted for 36.42% of the total variance, which is below the commonly accepted threshold of 50%. Therefore, common method bias is unlikely to have substantially influenced the relationships among the study variables.

Table 11: Reliability and Convergent Validity of Measurement Constructs

Construct	Cronbach's α	McDonald's Ω	Composite Reliability	AVE
Growth Mindset	0.86	0.87	0.88	0.56
Enjoyment	0.88	0.89	0.90	0.61
Hope	0.87	0.88	0.89	0.59
Anxiety	0.84	0.85	0.86	0.55
Boredom	0.82	0.83	0.85	0.53
Learned Helplessness	0.89	0.90	0.91	0.63

Table 11 summarizes the reliability and convergent validity of all latent constructs. Cronbach's alpha values ranged from 0.82 to 0.89, McDonald's omega values ranged from 0.83 to 0.90, and composite reliability values ranged from 0.85 to 0.91, indicating satisfactory internal consistency. The Average Variance Extracted (AVE) values exceeded the recommended threshold of 0.50 for all constructs, confirming adequate convergent validity.

Table 12: Confirmatory Factor Analysis (CFA) Model Fit Indices

Fit Index	Value	Recommended Cutoff
χ^2/df	2.41	<3.00
CFI	0.946	>0.90
TLI	0.934	>0.90
RMSEA	0.061	<0.08
SRMR	0.047	<0.08

Table 12 presents the overall goodness-of-fit statistics obtained from the confirmatory factor analysis. The model demonstrated a satisfactory fit to the observed data, with $\chi^2/\text{df} = 2.41$, CFI = 0.946, TLI = 0.934, RMSEA = 0.061, and SRMR = 0.047. All fit indices satisfied the recommended thresholds, indicating that the proposed measurement model adequately represents the relationships among the observed variables and latent constructs.

Table 13: Discriminant Validity Assessment Using the HTMT Criterion

Construct Pair	HTMT	Threshold
Growth Mindset – Enjoyment	0.78	<0.85
Growth Mindset – Hope	0.82	<0.85
Growth Mindset – Anxiety	0.79	<0.85
Growth Mindset – Boredom	0.77	<0.85
Enjoyment – Hope	0.74	<0.85
Anxiety – Boredom	0.72	<0.85

Table 13 reports the Heterotrait–Monotrait (HTMT) ratios used to assess discriminant validity among the latent constructs. All HTMT values ranged between 0.72 and 0.82, remaining below the recommended threshold of 0.85. These findings indicate satisfactory discriminant validity and confirm that the constructs are empirically distinct without significant construct overlap.

Discussion

The findings support the proposed relationships among growth mindset, learning emotions, and learned helplessness and are consistent with previous studies demonstrating that growth-oriented beliefs promote adaptive emotional responses and academic resilience [21], [28]. Students with a growth mindset are more likely to perceive academic challenges as opportunities for improvement, thereby increasing positive learning emotions such as enjoyment and hope while reducing negative emotions such as anxiety and boredom. Hope encourages goal-directed thinking and strengthens students' confidence in overcoming academic difficulties, whereas enjoyment promotes active engagement, persistence, and sustained participation in learning activities. These positive emotional experiences reduce the likelihood of developing learned helplessness by reinforcing students' beliefs that academic success can be achieved through continuous effort. In contrast, anxiety increases fear of failure and self-doubt, while boredom reduces attention, motivation, and learning engagement, making students more likely to withdraw from academic tasks and develop learned helplessness. These findings are consistent with Control-Value Theory of Achievement Emotions and Learned Helplessness Theory, which explain that students' emotional experiences directly influence motivation, persistence, and responses to academic setbacks. Compared with previous intervention-based studies such as [28], the present study extends existing knowledge by simultaneously examining enjoyment, hope, anxiety, and boredom as parallel mediators within a single theoretical framework.

using bootstrapped mediation analysis. From a practical perspective, teachers should incorporate growth mindset instructional practices that encourage effort, persistence, and constructive feedback, while school counselors should implement emotional support programs that reduce anxiety and boredom and strengthen hope and enjoyment during learning. These findings also provide guidance for intervention developers to design evidence-based educational programs that simultaneously promote adaptive beliefs and positive learning emotions to reduce learned helplessness and improve long-term academic resilience.

Limitation

- The study relies on self-reported questionnaire data, which may be influenced by social desirability and subjective bias, potentially affecting the accuracy of the results.
- The cross-sectional research design limits the ability to draw causal conclusions about how growth mindset and learning emotions influence learned helplessness over time.
- The use of convenience sampling may limit the representativeness of the sample and reduce the generalizability of the findings to the broader student population.
- The study was conducted among students in Guangdong Province, China; therefore, cultural and educational characteristics specific to this context may limit the applicability of the findings to other regions or countries.
- The study was conducted using data collected from a single province, which may limit the generalizability of the findings to students from other regions or educational settings.

Conclusion

This study examined how growth mindset is associated with learned helplessness through the mediating role of learning emotions using descriptive, correlational, regression, and bootstrapped mediation analyses. The results indicated that growth mindset has a strong positive relationship with greater enjoyment and hope and a negative relationship with anxiety and boredom, and these emotions, in their turn, have a significant correlation with the level of learned helplessness. The regression models showed high R^2 values which meant that a big percentage of the variance in learning emotions and learned helplessness was described by mindset and emotional variables. The findings of the mediation proved that growth mindset is associated with learned helplessness directly and indirectly on the lines of emotions, and the fact that emotional processes of students are the core factors in determining the motivational results. On the whole, the findings prove that the cultivation of the growth mindset and beneficial learning emotions are important in lessening learned helplessness and enhancing adaptive engagement with education.

Future Work

- ❖ Expand the model to incorporate other psychological variables like academic self-efficacy, resilience and grit to the model to further illustrate the role of the mindset in affecting learning outcomes.
- ❖ Apply longitudinal or experimental designs to investigate the dynamics of growth mindset and learning emotions throughout the course of time and to develop a better causal association.
- ❖ Determine the framework in various cultural, educational, and age-group settings as a way of enhancing the external validity of the results.
- ❖ Develop and evaluate targeted growth mindset and emotion-regulation interventions to assess their practical impact on reducing learned helplessness in real classroom settings.

Data Availability: <https://forms.gle/p2Qsfoq6divQ3aDE8>

DECLARATION

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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Author Contribution

Longting Yu contributed to the conceptualization, data collection, formal analysis, methodology, investigation, and original draft preparation of the study. Chia-Ching Tu contributed to supervision, validation, manuscript review, editing, and overall academic guidance. All authors read and approved the final manuscript.

Ethical Approval

This study was conducted in accordance with ethical standards for research involving human participants. Ethical approval was obtained from the relevant institutional review committee of Krirk University.

Consent to Participate

Informed consent was obtained from all participants prior to their participation in the study.

Consent to Publication

All authors have reviewed and approved the manuscript for publication.

Competing Interests

The authors declare that they have no competing interests.

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