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Exploring the Growth Mindset of Pre-Service Teacher Students in a Thai Context: An Exploratory Study

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ABSTRACT

The research project aimed to analyze the components of final-year pre-service teacher students' Growth Mindset and to study the characteristics of Growth Mindset. The population in this research study consisted of 349 final-year pre-service teacher students in Bangkok, Thailand. 48.453% of the variance was explained by components (a) Commitment Leading to Success, followed by (b) Challenge as Learning (7.176%), and (c) Self-Awareness (4.217%). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.955, indicating the appropriateness of the data for factor analysis. Bartlett's test of sphericity ($\chi^2 = 5259.906$, $p < .05$) confirmed the data's suitability for factor analysis. The Eigenvalues for the components ranged from 1.012 to 11.629. These findings suggest that pre-service teacher students with Growth Mindset are characterized by a strong commitment to achieving success, a propensity to view challenges as learning opportunities, and a heightened level of self-awareness. The results underscore the importance of incorporating Growth Mindset development into teacher education programs to foster resilience and adaptability among future educators.

Keywords: Pre-service teacher students, Growth Mindset, Fixed Mindset, Exploratory factor analysis, Confirmatory factor analysis.

Introduction

In today's rapidly evolving global context, the notion of developing human potential has become a focal point, particularly within the realm of education. Among the most influential concepts in this area is the Growth Mindset, introduced by Dweck (2006). This framework asserts that intelligence and abilities are not fixed traits but dynamic qualities that can be cultivated through dedication, effort, and learning from failure. Rather than viewing innate talent as the sole determinant of success, the Growth Mindset emphasizes that natural ability is merely a starting point. This perspective encourages resilience in overcoming obstacles and a proactive attitude toward challenges, promoting continuous self-improvement (Dweck, 2006). In contrast, the Fixed Mindset entails the belief that intelligence and skills are static and immutable. Individuals with this mindset often shy away from challenges, quickly surrender to difficulties, and demonstrate limited motivation for personal development (Dweck, 2006).

In the educational context, fostering a Growth Mindset is of paramount importance, particularly for educators who bear the responsibility of nurturing students' potential. Teachers with a Growth Mindset are better equipped to address the multifaceted challenges of the disruption era, characterized by rapid technological advancements and shifting educational paradigms. Such educators are more likely to embrace innovative technologies, adapt their teaching methodologies to meet diverse learner needs and create environments that support holistic student development. Additionally, these teachers serve as exemplary role models, demonstrating flexibility and resilience, which in turn inspires students to adopt similar attitudes toward challenges and lifelong learning (Heyder et al., 2023). By modeling a Growth Mindset, teachers cultivate a culture of persistence and adaptability, helping students to view challenges as opportunities for growth rather than as threats to be avoided.

However, the absence of a Growth Mindset or its misapplication can have detrimental effects on the learning process. Educators who hold a Fixed Mindset or misinterpret the principles of the Growth Mindset may inadvertently impose limitations on students' potential. For example, such teachers may fail to encourage students to take on challenging tasks, viewing difficulties as barriers rather than as opportunities for skill development. Furthermore, they might overlook the latent potential within students who do not initially excel, reinforcing negative

stereotypes about ability. Miscommunication of a fixed perspective can also create misconceptions among students, fostering the belief that success or failure is predetermined and immutable (Hu & Zhang, 2024). This not only stifles students' motivation to improve but also diminishes their ability to develop resilience and adaptive skills—key attributes in an unpredictable and complex world.

Given these dynamics, it is crucial to investigate the role of the Growth Mindset in teaching and learning, emphasizing its significance in fostering both educators' and students' development. When implemented effectively, this mindset can enhance the quality of education, equipping learners with the tools to navigate and thrive in an era of constant change. Moreover, cultivating a Growth Mindset within educational systems has the potential to generate long-term benefits for society by creating individuals who are resilient, adaptable, and committed to lifelong learning.

Thailand's education system is currently undergoing significant reforms aimed at transitioning from traditional, teacher-centered approaches to more student-centered and competency-based models (Hallinger & Lee, 2011). This shift places considerable pressure on teacher education programs to prepare future educators with the skills, adaptability, and mindset required to address the evolving demands of modern classrooms. Pre-service teachers play a pivotal role in this reform process; however, existing research indicates that many Thai educators continue to hold entrenched beliefs regarding intelligence and pedagogical practices, which may impede their ability to foster environments conducive to a growth-oriented learning culture (Saengboon, 2017). As such, the investigation of the mindset of pre-service teacher students in Thailand is both timely and essential for addressing this critical educational gap.

This study aims to address a critical gap in the existing literature by investigating the Growth Mindset of pre-service teacher students within the Thai educational context. Although prior research has consistently shown the positive effects of Growth Mindset interventions on student performance and motivation (Claro et al., 2016), there remains a paucity of research examining the development of Growth Mindset beliefs among pre-service teachers and the potential impact of these beliefs on their future pedagogical practices. A comprehensive understanding of the Growth Mindset in pre-service teachers is crucial to ensuring that they

are equipped to cultivate adaptive, resilient learners capable of thriving in an increasingly complex and dynamic educational environment.

In light of the ongoing educational reforms in Thailand, there is an urgent need to examine how pre-service teachers perceive their own capacity for growth and development. A lack of understanding in this area poses the risk that teacher education programs may fail to adequately prepare future educators to adopt and implement growth-oriented pedagogical approaches. This study, therefore, seeks to address this critical gap by investigating the Growth Mindset beliefs of pre-service teacher students in Thailand, offering essential insights that contribute both to local educational reform efforts and to the broader discourse on teacher development.

Literature Review

Growth Mindset

Mindset was proposed by Carol Dweck (Dweck, 2006), an American psychologist. It is stated that each person has two mindsets: a fixed mindset and a growth mindset. (Xiao et al., 2023) Though no one has only one theory of intelligence or simply mindsets, students can have two different hypotheses about their intellectual capacities. More fixed-minded people think that their intelligence is just a fixed attribute. They frequently approach learning with the intention of appearing intelligent, and they avoid problems because they think that having to put in much effort or making mistakes indicates that they are not very capable. On the other hand, those who have a growth mindset are more likely to regard effort as a motivating factor for learning and to view failures as chances to acquire new talents. They also think that skills can be developed.

A fixed mindset is characterized by the belief that abilities and intelligence are static traits that cannot be significantly developed. People with a fixed mindset tend to avoid challenges and give up easily when facing obstacles. On the contrary, people with a growth mindset believe that abilities and intelligence can be developed by their abilities. They view challenges and failures as opportunities for improvement. (Xiao, F. et al., 2023)

The concepts of student development using Growth Mindset (Visessuvanapoom & Tangpornpaiboon, 2023) are as follows:

(1) Growth Mindset relates to adaptability.

(2) Growth Mindset relates to learners' learning development.

(3) Growth Mindset relates to learners' good characteristics.

(4) Growth Mindset promotes learners' mental health.

Growth Mindset contains 3 elements (Wisessathorn, et al., 2022):

(1) Internal positive attitude

(2) Belief in development

(3) Appreciating the value of Growth Mindset

Growth Mindset of teacher students

Dweck (2006) defines a growth mindset as the belief that abilities and intelligence can be developed despite individual differences. This perspective encourages dedication, hard work, and learning to improve abilities. This is in accordance with Ricci (2013), who states that the meaning of a growth mindset involves understanding that intelligence and abilities can be developed through effort. This mindset emphasizes the importance of learning. Ricci highlights that cultivating a growth mindset involves encouraging a love for learning, valuing effort, and promoting resilience and adaptability in the face of setbacks, viewing them as opportunities for growth.

Phongprasertsin (2021) describes the growth mindset of student teachers as an individual mindset that expresses their perceptions. Abilities and intelligence are believed to be changeable and developable through dedication, hard work, challenges, maintaining effort and interest despite failures, and learning from criticism. These elements help in self-development and create learning processes and methods, particularly in the academic aspect. These are five key elements of a growth mindset, namely Belief in development, embracing challenges, persistence in the face of setbacks, emphasis on effort, and listening and learning from criticism. To begin, regarding *belief in development*, it is believed that each person can learn and develop. Understanding that intelligence and natural abilities can be developed through learning new things and building and improving new skills. Secondly, *embracing*

challenges refers to daring and learning to do new things, viewing challenges as interesting opportunities to study and grow, and understanding difficult or unfamiliar tasks can be opportunities to improve. Thirdly, *persistence in the face of setbacks* is the ability to deal with problems and maintain effort despite failures and obstacles. Acknowledging reality and adapting ways of thinking can solve problems and achieve goals. Fourthly, *emphasis on effort* is when recognizing that continuous effort, persistence, practice, and learning are crucial for improvement and success. Additionally, acquiring academic knowledge and employing effective learning processes and methods can help achieve desired outcomes. Fifthly, regarding *listening and learning from criticism,* it is important to consider the warnings, criticisms, and suggestions provided by others. Also, sharing knowledge, receiving others' opinions, and learning from others are ways to reflect thoughts, adjust, and refine deviations to improve in better ways.

To ensure effective teaching methods and cultivate a belief in students' potential, pre-service teachers must adopt a growth mindset. Future teachers' attitudes and views can be significantly shaped during the teacher education phase. Unresolved misconceptions from this period can limit teachers' influence on their students and obstruct their professional development. A unique strategy for creating a growth mindset in a short, effective, and economical intervention has been put forth to address this. In the first phase, pre-service teachers consider their own educational objectives. They can relate their goals to their job as future educators thanks to this reflective process. Writing a compelling letter to aspiring teacher education students emphasizing the good influence instructors can have on students' lives is the second step. Finally, this short intervention approach is a creative approach to help pre-service teachers develop a development attitude. Participants' perceptions of kids' learning potential are successfully changed, and their own preconceptions are addressed by fusing persuasive writing with reflective thinking. The method is effective, powerful, and scalable, and it is a viable way to train future teachers who are resilient, driven, and dedicated to empowering their students (Heyder et al., 2023).

Methodology

Population and sampling

The population in this research consisted of final-year teacher students who were expected to graduate in the second semester of the academic year 2023. The sample size was determined

using a criterion of 5 to 10 times the number of observable variables related to the Growth Mindset, which consists of 23 observable variables. Therefore, the sample size was set at 230 teacher-students. Data were collected from a total of 349 participants.

Research procedures:

This research is an exploratory study aimed at analyzing the components of the Growth Mindset framework. The procedure follows these steps:

Step 1: Review of Related Concepts and Theories on Growth Mindset.

Step 2: Development and Validation of Research Instruments.

The research instrument employed in this study was a questionnaire on Growth Mindset, adapted from the Growth Mindset Scale developed by Wisessathorn et al. (2022). This instrument was designed to cover the conceptual framework of the Growth Mindset comprehensively. The questionnaire was divided into two sections:

Section 1: General Information including gender, year of enrollment, and major/field of study.

Section 2: Growth Mindset Scale, consisting of 37 items across three dimensions: positive internal attitudes, confidence in self-development, and valuing cognitive growth. Each item was rated on a 7-point scale (0 = not at all reflective of your thoughts or character; 1 = slightly reflective; 2 = somewhat reflective or occasionally; 3 = moderately reflective; 4 = rather reflective; 5 = very reflective; and 6 = most reflective). The instrument's content validity index ranged from 0.66 to 1.00, and the overall reliability was 0.965.

Step 3: Data Collection. Data was collected from 349 final-year teacher students through an online survey using Google Forms during the graduation ceremony.

Step 4: Data Analysis. The researcher conducted quantitative data analysis using descriptive statistics, which were frequency, percentage, mean, and standard deviation. Exploratory Factor Analysis (EFA) was performed. Before conducting EFA, the researcher checked the preliminary assumptions, including the interrelationships

among variables, using the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) and Bartlett's test of sphericity.

Results

This study involved 349 participants, predominantly female (79.08%), with males making up 19.48% of the samples and 1.43% unspecified. Participants represented diverse academic fields, with the majority from the Thai Language (26.07%), Early Childhood Education (21.2%), followed by Social Studies (17.77%), and Primary Education (9.74%). Smaller proportions came from English, Mathematics, Science, Chinese, Physical Education, Arts, and Continuing Vocational Education majors. Some participants (5.16%) did not specify their field of study. The findings highlighted a notable gender imbalance and an uneven distribution across academic fields, with strong representation in certain areas influencing the study's context and potential outcomes.

Results of Growth Mindset Component Analysis

The Growth Mindset framework of final-year students consisted of four components: value effort and persistence, learn from criticism, embrace challenges, and inspire and be inspired by others' success. These components together explain 57.12% of the variance in the Growth Mindset variables, as detailed in Table 1.

Table 1: The number of variables, eigenvalues, percentage of variance (% of variance), and cumulative percentage of variance (% cumulative) for each component of the Growth Mindset framework (n = 349)

	Components	The number of variables	Eigenvalues	% of variance	% cumulative
1	Value Effort and Persistence (VP)	15	16.62	44.91	44.91
2	Learn from Criticism (LC)	6	1.96	5.29	50.20
3	Embrace Challenges (EC)	4	1.32	3.57	53.77
4	Inspire and Be Inspired by Others' Success (IB)	2	1.24	3.36	57.12
	Total	25			
Note: KMO = 0.959, Bartlett's test of sphericity = 7917.988, *df* = 666, p-value = 0.00					

From Table 1, it was found that the exploratory factor analysis of 349 final-year students extracted four components with eigenvalues ranging from 1.24 to 16.62. The KMO value was .959, which was close to 1.00, indicating that the data has a high level of correlation and is suitable for factor analysis. Additionally, Bartlett's test of sphericity yielded a value of 7917.988 ($p < .05$), indicating that the correlation matrix of the variables is significantly correlated.

Table 2: Results of the Exploratory Factor Analysis of Growth Mindset (GM) (n = 349)

	Component			
	1	2	3	4
Value Effort and Persistence				
32. Growth mindset helps in recognizing the real problem	.748			
28. Success is a matter of learning and practice.	.739			
29. Personal abilities can be changed through action (learning by doing)	.738			
33. Growth mindset enables individuals to find new solutions to problems	.735			
35. A growth mindset allows one to accept various changes	.707			
34. A growth mindset fosters creative thinking processes	.696			
27. Effort is the path to success.	.692			
24. Learning from previous mistakes for self-improvement	.685			
22. People can improve themselves.	.660			
23. Self-improvement is more important than overcoming others.	.631			
30. Many things can be done in the future to grow and learn in difficult situations.	.578			
37. Effort helps to advance an organization or unit	.578			
36. Effort changes everything that can be changed.	.566			
25. Open to new things	.541			
31. Enthusiasm always keeps one ready to learn	.514			
Learn from Criticism				
8. Having a good way to deal with mistakes		.664		
12. Having a method to motivate oneself		.625		
7. Having a method to motivate oneself		.614		
6. Knowing one's strengths and weaknesses		.593		
10. Accepting mistakes, whether intentional or unintentional		.552		
21. Learning from and accepting others' criticism, even if it is negative		.551		
Embrace Challenges				
15. Enjoying doing things that challenge one's abilities			.758	
16. Viewing challenges as opportunities to learn			.641	

	Component			
	1	2	3	4
3. Daring to express oneself creatively			.632	
19. Enjoying seeking constructive criticism			.597	
Inspire and Be Inspired by Others' Success				
11. Failure is the result of insufficient effort.				.729
14. Finding inspiration from others' success				.673

From Table 2**,** it was found that the components of the Growth Mindset framework consisted of 1) Value Effort and Persistence, 2) Learning from Criticism, 3) Embrace Challenges, and 4) Inspire and Be Inspired by Others' Success. Each component comprises the following indicators:

1) Value Effort and Persistence (VP) consisted of 15 indicators:
1.1) Growth Mindset helps in recognizing the true problem (C32)
1.2) Success is a matter of learning and practice (B28)
1.3) Personal abilities can be changed through action (learning by doing) (B29)
1.4) Growth Mindset enables individuals to find new solutions to problems (C33)
1.5) Growth Mindset allows one to accept various changes (C35)
1.6) Growth Mindset fosters creative thinking processes (C34)
1.7) Effort is the path to success (B27)
1.8) Learning from past mistakes for self-improvement (B24)
1.9) People can improve themselves (B22)
1.10) Self-improvement is more important than overcoming other people (B23)
1.11) Many things can be done in the future to grow and learn in difficult situations (B30)
1.12) Effort helps to advance an organization or unit (C37)
1.13) Effort changes everything that can be changed (C36)
1.14) Open to new things (B25)
1.15) Enthusiasm always keeps one ready to learn (B31)

2) Learn from Criticism (LC) consisted of 6 indicators:
2.1) Have a good way to deal with mistakes (A8)
2.2) Have a method to motivate oneself (A12)
2.3) Not worry about shortcomings as an obstacle to self-improvement (A7)
2.4) Know one's strengths and weaknesses (A6)

2.5) Accept mistakes, whether intentional or unintentional (A10)

2.6) Learn from and accept others' criticism, even if it is negative (A21)

3) Embrace Challenges (EC) consisted of 4 indicators:

3.1) Enjoy doing things that challenge one's abilities (A15)

3.2) View challenges as opportunities to learn (A16)

3.3) Dare to express oneself creatively (A3)

3.4) Enjoy seeking constructive criticism (A19)

4) Inspire and Be Inspired by Others' Success (IB) consisted of 2 indicators:

4.1) Failure is the result of insufficient effort (A11)

4.2) Find inspiration from others' success (A14)

Results of construct validity testing of the Growth Mindset model

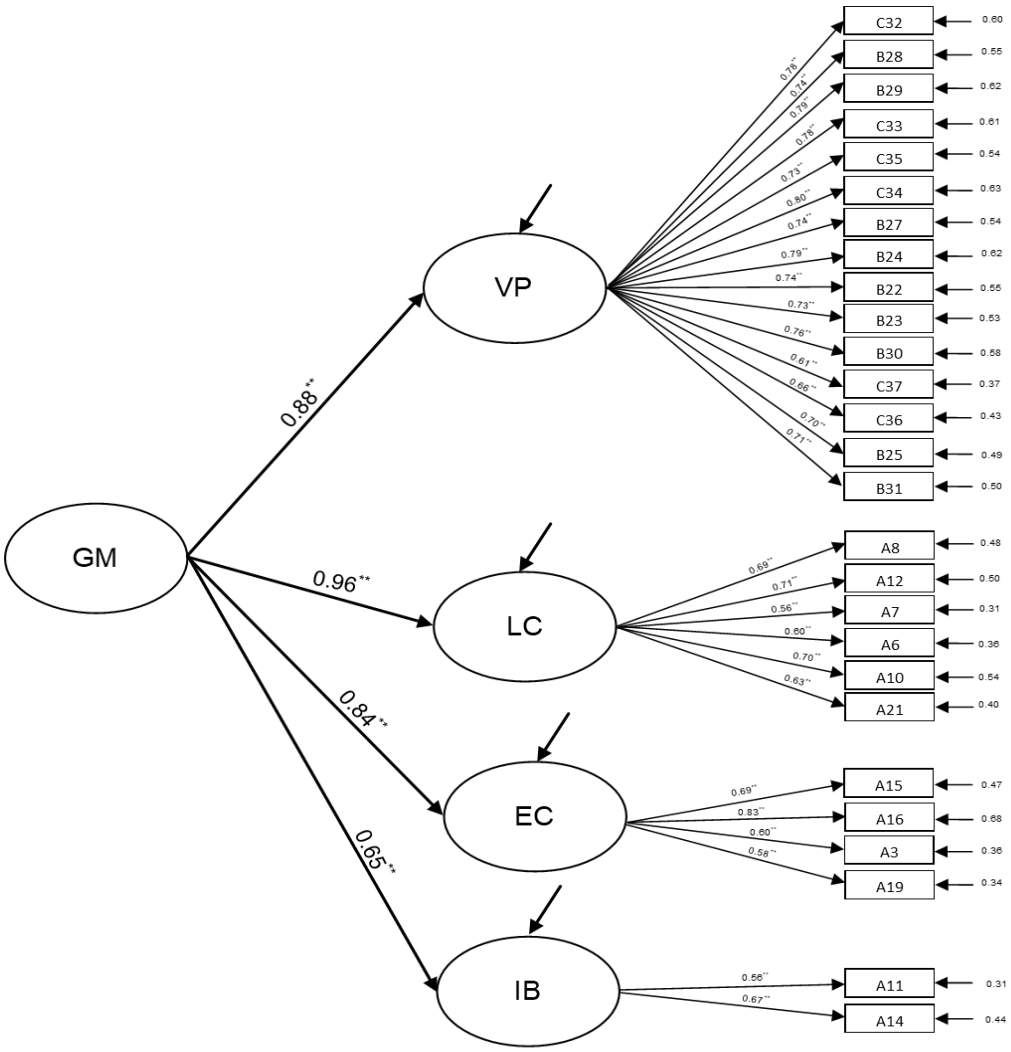

Figure 1: The Growth Mindset Model Components of Pre-service Teachers

The construct validity was tested using Secondary Order Confirmatory Factor Analysis (CFA) to examine the alignment between the model's structure and the indicators of Growth Mindset. The findings revealed that the measurement model demonstrated good construct validity showing a strong fit with the empirical data. The model fit indices were as follows: Chi-square = 527.193, df = 295, p-value = .000, CMIN/DF = 1.787, GFI = .897, NFI = .909, TLI = .949, CFI = .957, RMSEA = .048, and RMR = .051. These indices indicate that the measurement model was well-aligned, as detailed in Figure 1.

Conclusion

Growth Mindset is the belief that personal attributes, particularly abilities, motivation variables, and intelligence, can be developed and changed through effort, dedication, persistence, and inspiration, leading to success (Barroso et al., 2023; Rammstedt et al., 2024; Hu & Zhang, 2024). From the Exploratory Factor Analysis conducted on final-year teacher students, four components were extracted: Value Effort and Persistence, Learn from Criticism, Embrace Challenges, and Inspire and Be inspired by Others' Success. The eigenvalues for these components ranged from 1.24 to 16.62. The analysis yielded a KMO value of .959, and Bartlett's test of sphericity was 7917.988 ($p < .05$). Further Confirmatory Factor Analysis revealed that the measurement model demonstrated good construct validity, showing a strong fit with the empirical data. The fit indices were as follows: Chi-square = 527.193, df = 295, p-value = .000, CMIN/DF = 1.787, GFI = .897, NFI = .909, TLI = .949, CFI = .957, RMSEA = .048, and RMR = .051. Each component is discussed as follows:

Component 1: Value Effort and Persistence

This component reflects the belief that diligent action, learning, and practice will lead to success. Individuals with this mindset perceive mistakes and challenges as opportunities to gain deeper insight into problems and use these experiences for self-improvement. This aligns with the findings of Wisessathorn et al. (2022), who identified self-confidence as the second component of a growth mindset, emphasizing that people can develop themselves through learning, practice, effort, and action.

Component 2: Learn from Criticism

This component is defined by the belief that self-improvement can be achieved through both self-criticism and feedback from others. It encompasses the perspective of viewing criticism

as an opportunity for personal growth. For instance, criticism is regarded as a tool for development, while mistakes are seen as valuable lessons that can inform future prevention and correction. This mindset applies to both negative criticism and praise, which are perceived as sources of motivation. Individuals with this outlook understand the significance of mistakes, using them as a guide for improvement rather than interpreting them as punitive measures. This is consistent with Srirat and Siribanpitak (2019), who found that the development of a teacher's mindset involves listening to and accepting criticism from others as a tool for self-improvement. It also aligns with Wisessathorn et al. (2022), where the first component, a positive internal attitude, includes recognizing one's strengths and weaknesses, accepting mistakes, and embracing negative criticism. Additionally, it resonates with Pongprasertsin et al. (2022), who found that pre-service teachers should be open to criticism and willing to accept feedback from others.

Component 3: Embrace Challenges

This component reflects the belief that a growth mindset arises from having enough effort and persistence and viewing various situations as challenges to overcome. These individuals use constructive criticism to improve their work and do not easily give up. This is in line with Srirat and Siribanpitak (2019), who emphasized the need for teachers to develop a growth mindset that includes a love for challenges.

Component 4: Inspire and Be Inspired by Others' Success

This component is characterized by the belief that inspiration and motivation drawn from others' success are essential for personal development. This aligns with Srirat and Siribanpitak (2019), who stated that finding inspiration in the success of others is crucial, as it helps individuals see that they have goals and that they, too, can achieve them.

Discussion

The findings of this study provide significant insights into the Growth Mindset of pre-service teacher students in Thailand, identifying four key dimensions: valuing effort and perseverance, learning from constructive criticism, embracing challenges, and drawing inspiration from the success of others. These dimensions underscore the critical role of a Growth Mindset in cultivating resilience, adaptability, and reflective teaching practices. Pre-service teachers who possess a Growth Mindset are more inclined to view effort and perseverance as fundamental to achieving success, regard constructive feedback as an

essential tool for continuous self-improvement, confront challenges with determination, and find motivation in the achievements of others.

These findings highlight the imperative of integrating Growth Mindset principles into teacher education programs to prepare future educators better to meet the evolving demands of modern classrooms. By fostering the development of a Growth Mindset, pre-service teachers are more likely to create learning environments that emphasize student-centered pedagogies and encourage the cultivation of similar growth-oriented mindsets among their students. This study contributes to the broader discourse on educational reform in Thailand, emphasizing the need for further research to explore the systematic integration of Growth Mindset principles into teacher education curricula.

Regarding the dimensions with the strongest associations, it is evident that a Growth Mindset equips individuals with the capacity to discern the underlying causes of problems, formulate effective strategies to address errors, embrace challenges that test their abilities, and interpret failure as a result of insufficient effort rather than inherent inability. Individuals with a Growth Mindset exhibit a strong aptitude for solving daily life problems, maintaining a constructive outlook in the face of adversity, and believing that every challenge has a solution. They address problems progressively, demonstrating persistence, patience, and adaptability throughout the process.

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