

**Teachers' Intelligence Mindsets in Mainland China: Exploring Their Relationship with
Teaching Practices, Contextual Influences, and Students' Learning-Related Outcomes
through Growth Mindset Theory**

by

ZHANG Kai

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Statement of Originality

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Abstract

The concept of intelligence mindset, particularly as delineated by Dweck et al. and known as growth mindset theory, has emerged as pivotal in influencing teaching practices and student learning-related outcomes. However, current literature presents counter-intuitive findings implying a possible perceived contextual sensitivity within growth mindset theory. Responding to this gap, the present study investigates how teachers' intelligence mindsets—shaped by their cultural orientation and perceived school climate—ultimately affect student learning-related outcomes, along with exploring if teachers' intelligence mindsets could predict corresponding mindset feedback in their classroom teaching practice. Grasping these relationships is critical for guiding educational interventions and policy development that promote effective teaching.

Specifically, the study explores the relationship between teachers' intelligence mindsets and their mindset feedback in teaching practices, examines how cultural orientation and perceived school climate influence the formation of teachers' intelligence mindsets, and investigates the correlation between teachers' intelligence mindsets and student learning-related outcomes. Data was collected from 810 teachers using instruments such as the Growth Mindset Inventory, Cultural Values Scale, and School-Level Environment Questionnaires. Additionally, 12,165 students taught by these teachers were surveyed to measure their learning-related outcomes, including learning motivation, learning self-efficacy, learned helplessness, and learning engagement through validated scales such as the Academic Motivation Scale, Learning Self-Efficacy Scale, Learned Helplessness Scale and the Utrecht Work Engagement Scale for Students.

Several important findings are obtained to illustrate the intricate relationship among teachers' intelligence mindsets, their teaching practices, contextual influences, and students' learning-related outcomes in the school context of mainland China, which enrich the

discourse of growth mindset theory in relation to its context-sensitivity nature. First, the results suggest that teachers who self-reported as having a growth mindset showed more growth mindset feedback in classroom teaching practice than their fixed mindset counterparts. Second, regarding the effect of contextual influences on teachers' intelligence mindsets, the results suggest interesting dimension-specific patterns. Specifically, in terms of the influence of the contextual factor—cultural orientation, teachers' growth mindset was positively related to long-term orientation and negatively related to power distance and uncertainty avoidance, but not significantly related to individualism and motivation towards achievement and success. In terms of the influence of another contextual factor—perceived school climate, teachers' growth mindset was positively related to school resources, decision-making, and instructional innovation, but not with collaboration and student relations. Third, teachers' growth mindset positively predicted students' learning-related outcomes, including learning motivation, learning self-efficacy, and learning engagement, while negatively predicted learned helplessness. The results further illustrated that the two contextual factors—cultural orientation and perceived school climate—showed a dimension-specific pattern of moderating effects on the relationship between teachers' growth mindset and students' learning-related outcomes. Regarding cultural orientation, the dimension long-term orientation significantly strengthened the effect of teachers' growth mindsets on students' learning motivation, self-efficacy, engagement, but weakened its negative effect on learned helplessness; however, other dimensions such as power distance and uncertainty avoidance negatively moderated these relationships. Regarding perceived school climate, the dimensions such as rich school resources, decision-making, and instructional innovation significantly strengthened the effect of teachers' growth mindsets on students' learning motivation, self-efficacy, and engagement, but weakened its negative effect on learned helplessness. Notably, no significant moderating effects were found for other dimensions of

these contextual factors, including individualism, motivation for achievement for cultural orientation and success, collaboration, and student relations for perceived school climate.

Theoretically, this study provides nuanced insights by integrating previously overlooked perceived contextual factors into the growth mindset framework. It argues that growth mindset is not a universally operative construct, but one whose effects are conditioned by specific cultural values and institutional climates. By identifying how discrete cultural dimensions (e.g., power distance, long-term orientation) and school climate features (e.g., instructional innovation, participatory decision-making) shape the function and impact of teacher mindsets, the study contributes to a more context-sensitive understanding of implicit theory frameworks. Practically, it clarifies how contextual factors shape teachers' intelligence mindsets and moderate their effects on students' learning-related outcomes.

Keywords: Growth mindset, *mindset* feedback, contextual factors, moderating effects, learning-related outcomes

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G: Utrecht Work Engagement Scale for Students

H: Semi-Structured Interview Questions

I: Classroom Observations Form

J: Participant Forms, Information Sheet, Letter of Invitation]

K: Sample Coding



List of Abbreviations

HMSIT	Hypothesised Model for the Socialisation of Implicit Theories of Intelligence
SLEQ	School-Level Environment Questionnaire
GMI	Growth Mindset Inventory
CVScale	Cultural Values Scale
AMS	Academic Motivation Scale
LSES	Learning Self-Efficacy Scale
LHS	Learned Helplessness Scale
UWES	Utrecht Work Engagement Scale for Students
HREC	Human Research Ethics Committee



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Chapter 1: Introduction

1.1 Introduction

This chapter describes the scope of the study, aim and objectives, research questions and hypotheses, significance of the study and the structure of the thesis.

1.1.1 Background of Growth Mindset Research in Education

Within the framework of Implicit Theories of Intelligence, growth mindset, developed by Dweck (2006) and emanating from the incremental theory of intelligence, advocates the notion that individuals possess the potential to enhance their intelligence through sustained effort, resilience, and learning from setbacks. In contrast, a fixed mindset, entrenched in the entity theory of intelligence, posits that individuals' intelligence is innate and immutable, irrespective of effort (Dweck, 2006). Existing literature refers to this concept as growth mindset theory (Hanson, Bangert & Ruff, 2016), or mindset theory (Bernecker & Job, 2019). The theory has garnered significant attention within the educational community, emphasizing the critical role of teachers' implicit theories of intelligence. Teachers' intelligence feedback provided in-situ significantly influences their interpretations of students' psychological and motivational outcomes (Zhang et al., 2017)—referred to collectively in this study as learning-related outcomes—including students' self-perception of learning motivation, learning self-efficacy, learned helplessness, and learning engagement. In the present study, these four outcomes were selected because existing literature consistently identifies them as significant psychological and motivational factors that shape students' overall educational experiences (see for example, Bedford, 2017; Rhew et al., 2018; Fang, 2022). However, research exploring how teachers' implicit theories of intelligence influence students' learning-related outcomes, as perceived outcomes, remain limited compared to studies focusing on objective measured outcomes, such as academic achievement (Zhang & He, 2025). This gap persists

despite Dweck's (2006) explicit assertion that growth mindset primarily shapes individuals' subjective motivational outcomes, instead objected outcomes, through beliefs about intelligence malleability. Moreover, notable attention is given to teachers' critical role in growth mindset, as empirical research has reported teachers as a facilitator for cultivating students' growth mindset (Yeager et al., 2022). In addition, the results regarding growth mindset have been inconsistent: some studies have reported a positive predictive effect of growth mindset on academic outcomes (Li & Bates, 2019; Lin et al., 2020), while others have found a negative correlation (Sun, 2021). Such paradoxical research findings call for incorporating contextual factors when investigating teachers' critical role in growth mindset, detail discussion on the contextual sensitivity of growth mindset theory is provided in Section 2.4.

Collectively, examining teachers' mindset beliefs, their corresponding mindset feedback in teaching practice, and the relationship between these beliefs and students' learning-related outcomes—together with perceived contextual factors—strengthens the theoretical understanding of how implicit theories of intelligence influence students' psychological and motivational development within specific educational settings. This comprehensive perspective also provides valuable guidance for designing practical interventions and informing educational policies aimed at cultivating growth mindset – oriented learning environments.

In addition, further questions worth exploring concern the methodology commonly adopted in existing growth mindset literature. Since the growth mindset theory has been proposed and applied in real teaching scenarios to assess people's mindset belief. Self-reporting, A self-report Likert-scale questionnaire, originally developed in Dweck's early work (Dweck et al., 1995), has been widely used to measure teachers' implicit beliefs about intelligence (Laine et al., 2016; Lin et al., 2022; Yu et al., 2022; Zeng et al., 2019). However,

it provides little evidence about how such beliefs are enacted in real classroom practices. This leaves ambiguity on the possible incongruity between a teacher's mindset belief and their mindset belief feedback in actual teaching practice. Therefore, examining teachers' actual feedback behaviors in real teaching scenarios could offer stronger empirical evidence of the relationship between teachers' mindset beliefs and their actual teaching practice. In relation to the present study, it would clarify whether teachers who self-report having a growth mindset indeed demonstrate more growth-oriented feedback in the classroom compared to those reporting a fixed mindset. Therefore, this study argues it is risky to judge a teacher's mindset and their mindset feedback in the classroom by only relying on the result of self-reporting, as Buehl and Beck (2014) highlighted that an individual's responses may differ between deliberated responses (self-report data) and actual behaviors in-situ (field data). Subsequent studies (Rissanen et al., 2019; Zhang & He, 2024b) have validated these measures by adopting multiple methods, including questionnaires, interviews, and classroom observations, to examine how growth mindset operates within local teaching contexts. These mixed-method approaches have yielded more comprehensive and contextually grounded insights, especially on the understanding of teachers' actual mindset feedback in the classroom.

In light of these methodological advancements, careful attention must also be given to the contextual setting in which such beliefs and behaviors are studied. The present research focuses specifically on middle school teachers and students in mainland China. This population was selected not only due to sampling feasibility, but also because middle school represents a formative stage in adolescents' academic and psychological development. The transition from primary to middle school is a major life event that reshapes students' peer networks, academic expectations, and relationships with teachers (Symonds, 2015). Students at this stage are particularly sensitive to social and emotional cues, making them more responsive to the type and tone of feedback they receive (Susman & Rogol, 2004). At the

same time, middle school teachers often face considerable institutional pressure stemming from high-stakes examinations and performance-based accountability (Au, 2007). These contextual features make the middle school setting particularly suitable for examining how teachers' mindset beliefs are expressed through instructional feedback and how such feedback may influence students' learning-related outcomes.

1.1.2 Teachers' Implicit Theory of Intelligence, Corresponding Mindset Feedback and Perceived Contextual Factors

Teachers' actual manifestation of their mindset beliefs, or teachers' growth mindset feedback in teaching practice, has been considered a promising approach to positively influence students' learning motivation (Cutler, 2021). Generally, teaching practice significantly impacts students' overall learning experiences, as it directly reflects how teachers translate their educational beliefs into actionable behaviors that students experience daily (Sabarwal et al., 2022). Teachers' implicit theories of intelligence theoretically shape the type of feedback they deliver in classroom settings, and empirical evidence supports this assertion. For example, Yu et al. (2022) identified that teachers' implicit theories of intelligence—whether viewing intelligence as fixed or malleable—significantly influenced the nature and type of feedback provided to students. Yeager et al. (2022) further demonstrated that students' growth mindsets must be supported by their teachers' corresponding growth mindset feedback practices in the classroom (teachers: $n = 223$; students: $n = 9,167$). Moreover, using the lens of growth mindset theory, Dweck (2006) conceptualized intelligence feedback in terms of five dimensions: challenges, obstacles, effort, criticism, and the success of others. These dimensions manifest differently depending on teachers' mindset beliefs, resulting in either process-focused feedback, emphasizing effort, strategies, and persistence, or ability-focused feedback, highlighting innate talent and fixed abilities. Empirical research (Rissanen et al., 2019) illustrates such variations in feedback

types. For example, teachers may employ entity-focused language like “it’s too difficult a task for you,” reinforcing students’ beliefs in fixed abilities and potentially undermining motivation. Conversely, incremental feedback such as “you need to put in more effort” emphasizes effort and persistence, promoting students’ motivation and resilience. Neutral feedback, such as “it’s fine, take it slow,” carries no explicit mindset implications. However, existing literature provides limited empirical evidence on whether teachers’ mindsets can predict corresponding mindset-related feedback in their teaching, which motivates the present study to explore this relationship further.

For understanding teachers’ mindset beliefs, the present study argues that perceived contextual factors are critical considerations. From a theoretical perspective, the teacher ecology model (Duehl & Beck, 2014) suggests that perceived local context serve as key influences in shaping teachers’ beliefs about the nature of intelligence. By applying Hofstede’s Cultural Dimensions Theory (2010) and Moos’s theoretical framework (1974) in growth mindset, the current study focuses on the two specific perceived contextual factors, as teachers’ cultural orientation and perceived school climate. The former indicates the influence of teachers’ personal cultural values on mindset formation, while the latter operates on the teachers’ perceived school climate, exploring the ways that the teaching environment can promote or hinder the formation of teachers’ mindset (see Section 2.4.1 for more discussions). Previous literature has actually implied the cultural sensitivity within the implicit theory of mindset belief (Rissanen et al., 2019. Yu et al., 2020). For example, an international comparative study further indicates that even though Chinese and Finnish teachers share the same mindset but adopt different pedagogical strategies in the culturally different classroom (Zhang & Tirri, 2020). Those literature collectively calls for exploring such cultural sensitivity when enriching the understanding of growth mindset theory, like What Yeager et al.’s (2020, p.1273) argued, “unexplained heterogeneity (contextual factors)

should be a starting point for future theory (growth mindset) development”. Therefore, the present study argues that such contextual differences, both individual cultural orientation and perceived school climate, could be potential moderating factors in teacher’s mindset belief-students’ learning-related outcomes relations. Specifically, this study focuses on cultural orientation factors such as power distance, uncertainty avoidance, individualism, motivation toward achievement and success, and long-term orientation, as well as school climate factors including collaboration, student relations, school resources, decision-making, and instructional innovation. See Section 2.4.1 for more discussions.

In order to deepen the understanding of the role played by cultural orientation and perceived school climate within the implicit theory of mindset belief, several theories provide insightful perspectives to elucidate the issue. For example, regarding cultural orientation, Bandura’s (1978) social cognitive theory, especially the concept of triadic reciprocal determinism, emphasizes the dynamic interactions among personal factors, cultural influences, and behavior. This systemic viewpoint highlights how both individuals’ cultural orientation influences their beliefs about intelligence (Schiavo et al., 2019). Similarly, Nisbett’s (2003) cultural psychology perspective stresses that cultural orientation is essential in forming intelligence beliefs, suggesting that cognitive processes, such as intelligence perceptions, are deeply embedded within cultural frameworks. The relationship between cultural orientation and intelligence beliefs is particularly apparent when observed within specific contexts. For example, Chinese culture strongly emphasizes persistent effort rather than innate talent, promoting educational practices that nurture perseverance, diligence, and beliefs in self-improvement (Zhao, 2011). Such a cultural emphasis aligns closely with growth mindset principles, which assert that intelligence and abilities can be enhanced through consistent effort and determination. Thus, examining how cultural orientation influences an individual’s growth mindset is crucial in educational environments, as these

factors significantly affect how a growth mindset is encouraged and demonstrated in classrooms (Brandisauskiene et al., 2021). Teachers from cultures valuing effort are more likely to naturally embrace and advocate for a growth mindset, actively motivating students to tackle challenges. Conversely, teachers influenced by cultural norms that privilege inborn ability over effort may be less supportive of growth mindset frameworks, a perspective often evident in their teaching approaches and potentially detrimental to the development of such mindsets in learners (Mesler et al., 2021).

With respect to the perceived school climate, prior research (e.g., Charlton et al., 2021; Sanchez et al., 2022) has consistently underscored the critical role of teachers' perceptions of their school environment in shaping belief systems. A positive and supportive school climate, for instance, fosters a sense of inclusion among educators—an essential condition for cultivating and sustaining growth mindset beliefs within educational settings. These results are supported by Bandura's (2001) social cognitive theory and empirical evidence from organizational climate research (Schneider et al., 2013), which collectively emphasize the critical role of contextual factors in shaping individual beliefs. Therefore, a positive perceived school climate acts as a critical factor in fostering teachers' growth mindset. Such an atmosphere not only encourages teachers to adopt and maintain effective instructional strategies but also enhances their continuous learning and adaptability—both vital elements for nurturing a growth mindset. Supporting this perspective, Rissanen et al.'s (2019) recent case study of Finnish schools found that teachers' favorable views of school climate, particularly regarding instructional innovation and inclusivity, significantly influenced their growth mindset formation. These findings underscore the necessity of further examining the connection between teachers perceived school climate and their mindset belief.

1.1.3 Response to The Research Limitations of Teachers' Mindset in Mainland China

In China, the trend of providing teachers with growth mindset training furthers the

necessity to acquire a deep understanding of growth mindset theory in the local context. By reviewing the existent literature on addressing growth mindset, it is not difficult to find an increasing number of studies that have been making efforts on encouraging the cultivation of Chinese teachers' mindset (Chen et al., 2021; Lin et al., 2022; Zhang & Koshmanova, 2021). However, to the best of current knowledge, study examining the relationship between teachers' growth mindset, their mindset feedback, and students' learning-related outcomes in Mainland China remains scarce. Most existing studies have primarily explored the association between teachers' growth mindset and other psychological traits, rather than its direct impact on students (see Table 3 in Section 2.4.2). Furthermore, recent findings by Huang et al. (2022) emphasize that the impact of growth mindset varies considerably across populations, as the underlying mechanisms through which it functions may differ between Western and Eastern cultural contexts. Growth mindset theory was originally developed in a Western cultural setting, research on its localization and adaptation in Mainland China is still in its early stages. The lack of research on how growth mindset is acculturated within the Chinese educational system may lead to misinterpretations and improper applications of the theory, potentially resulting in contradictory findings, not to mention the design for further mindset intervention. Indeed, existing literature has already reported counterintuitive results in the Chinese context—for instance, a study by Sun et al. (2021) found a negative correlation between Chinese students' growth mindset and their mathematics performance, a finding that contrasts with results observed among their U.S. counterparts. These discrepancies imply the necessity of considering contextual factors when examining growth mindset in Mainland China, as failing to account for contextual influences may lead to misleading conclusions regarding its impact and effectiveness.

To reiterate, limited consideration of the growth mindset theory's acculturation results within the existent literature are predominantly a result of being mainly focused on

quantitative methods (questionnaires). Actual behaviours in-situ (field data) were missing the present literature to provide more academic evidence on whether individual's mindset belief is corresponded with his mindset feedback in certain context. Numerous research studies in psychology have indicated that human behaviors, like teaching (Gemmink et al., 2021; Rubie-Davies et al., 2012) are influenced by the environment, manifesting in certain behaviors being reinforced or suppressed by an individual's culture or workplace. It collectively indicates that observing people's responses to mindset feedback and examining contextual factors are crucial aspects of localizing the growth mindset theory, leading to reveal the mechanism of growth mindset theory in the local context. Combining this with the developmental growth mindset trend in teaching scenarios in Mainland China, it can add to the importance of examining the growth mindset in a Mainland Chinese context. To address this concern, this study evaluates the relations of the growth mindset, contextual factors and students' learning-related outcomes by adopting a mixed methodology (see details in Section 3.3). Variables including students' learning motivation, learning self-efficacy, learned helplessness and learning engagement are considered in this study to further investigate the effects of teachers' growth mindset on predicting students' learning-related outcomes. Such responses of adopting an examination of the context and by using a mixed methods approach, it has been used in previous research in Finland (Rissanen, 2018a; 2019), with valuable results on clarifying how teachers' implicit theory is influenced by the local context, addressing the possible incongruous nature between teachers' self-reporting and actual teaching practice. Underpinned by previous research (Rissanen, 2018a; 2019), this study collects data from real-life teaching practice to capture both teachers' implicit theory of intelligence and actual teaching practice in a Mainland Chinese context.

From a more practical perspective, China presents a valuable research context for two main reasons. First, limited studies have examined the effect of growth mindset on predicting

learning-related outcomes in the local context, and research on the acculturation of growth mindset remains scarce. Given that most existing studies assess Chinese teachers' mindset beliefs through self-reported measures (see, for example, Chen et al., 2021; Lin et al., 2022; Yu et al., 2022), concerns arise about whether these self-reported beliefs accurately reflect actual teaching practices in the classroom. Second, research in China has yielded both supportive and unsupportive findings regarding the effect of growth mindset, with studies reporting positive effects (Li & Bates, 2019; Lin et al., 2020) as well as negative outcomes (Sun, 2021). Although these studies primarily focus on academic outcomes, the inconsistencies observed may implicitly suggest that contextual factors influence how growth mindset operates within educational settings. Such contradictory results highlight the necessity of further investigating the relationship between growth mindset, mindset feedback, and learning-related outcomes in the Chinese educational context.

1.2 Study Aims and Objectives

This research aims to examine the application of teachers' implicit theory of intelligence in a Chinese context, specifically to explore the possible relation between teachers' mindset beliefs, mindset feedback and students' learning-related outcomes, and to do so with the consideration of the local context. This determines that the study objectives should include teachers' implicit theory of intelligence, corresponding mindset feedback in teaching practice, students' learning-related outcomes, and context-related variables including cultural orientation and perceived school climate. These common variables appear in the existent literature on exploring the application of growth mindset theory to reality (see for example, Masters, 2014; Zeng et al., 2019; Zhang & He, 2024a, 2024b, 2024c). For this study, the first objective refers to teachers' implicit theory of intelligence, to investigate teachers' perception of intelligence belief as being of growth or of a fixed quality. The second objective is to explore teachers' mindset feedback frequency in the classroom, which is about exploring

their actual teaching practice. This includes specific teaching behaviour, mainly to focus on investigating those teaching practices as being consistent with individual's perception of intelligence belief. This would also allow us to test whether teachers with a fixed or growth mindset may be likely to adopt a process-focused or an ability-focused teaching pedagogy in the classroom. The third objective is related to students' learning-related outcomes, referring to students' learning motivation, learning self-efficacy, learned helplessness and learning engagement. This makes it possible to explore the correlation between teachers' beliefs about intelligence and students' learning-related outcomes. The fourth objective is to explore the effects of teachers' cultural orientation and perceived school climate on mindset formation, and to further investigate whether variables stemming from either individual cultural orientation or perceived school climate might moderate the relationship between teachers' growth mindset and students' learning-related outcomes.

1.3 Research Questions, Conceptual Framework and Hypotheses

Reviewing the research limitations discussed above and drawing together the initial ideas presented in the previous section, the research questions in this study relate to exploring teachers' mindset in China. The research questions and corresponding hypotheses are as follows:

Research question 1: Do teachers with self-report as growth mindset show more growth mindset feedback in the classroom than those with a fixed mindset?

Research question 2a: Do teachers' cultural orientation influence the formation of their mindset?

Research question 2b: Do teachers' perceived school climate influence the formation of their mindset?

Research question 3: Is there a significant correlation between teachers' growth mindset and students' learning-related outcomes?

Research question 3a: Does teachers' cultural orientation moderate the relationship between teachers' growth mindset and students' learning-related outcomes?

Research question 3b: Does teachers' perceived school climate moderate the relationship between teachers' growth mindset and students' learning-related outcomes?

A conceptual framework (Figure 1) is developed to visually illustrate the proposed relationships among the key variables.

Hypotheses 1 (H1). Existing studies have considered teachers' growth mindset, compared to those who with fixed quality, as being a positive factor related to high teachers' work engagement (Zeng et al., 2019), well-being & effectiveness (Shoshani, 2021), autonomous motivation (Nalipay et al., 2021) and process-focused pedagogical thinking (Rissanen et al., 2019), the teaching pedagogy is used to improve students' ability then meet their learning needs. However, teachers with a fixed mindset were observed as using trait-focused teaching pedagogy in the classroom (Rissanen et al., 2019), which tend to interpret behaviour as a fixed personal trait. Those findings imply that teachers with growth mindset may show more growth mindset feedback than teachers with fixed mindset. Consequently, this study hypothesizes that teachers with a growth mindset are more likely to provide growth mindset feedback in the classroom than those with a fixed mindset. In essence, this research posits that a teacher's teaching practices are largely reflective of their personal mindset believes.

Hypotheses 2a (H2a) and 2b (H2b). Regarding to the formation of mindset, there have been studies (see Figure 4 in Section 2.4.1) suggesting that context can shape teachers' individual beliefs in intelligence, implying their implicit theory of intelligence to be perceived culturally different. Specifically, studies have reported that perceived cultural values, like long-term orientation and effort making are both highly respected in the Chinese population (Hofstede et al., 2010). Interestingly, such value like effort marking is heavily

referenced by Dweck (2006) as being the factors related to identifying the growth mindset. More, one later study of Chinese ($n = 50$) and Finnish teachers ($n = 77$) indicated that even teachers who were self-reported as the same mindset, their teaching pedagogy were observed quite differently, due to the influence comes from the local context (Zhang, et al., 2020). Also, a number of psychological studies have indicated a strong relationship among teachers' beliefs, practices, and contextual factors (Jamalzadeh & Shahsavari, 2015; Rubie-Davies & McDonald, 2012; Morales & Hernández, 2023). Such literature supports the hypothesis to question 2 that teachers' cultural orientation and perceived school climate influence the formation of their mindset. See Section 2.4.1 for an elaboration.

Hypotheses 3 (including H3a and H3b). There have been some studies exploring the relation between teachers' mindset and factors such as self-efficacy (Lin et al., 2022), work engagement (Zeng et al., 2019), ability-focused pedagogy (Rissanen, et al., 2019) and grit (Zhao et al., 2018). Common findings derived from those studies reported that Chinese teachers' growth mindset is positively related to such mentioned variables, and those variables generally are widely recognised as beneficial factors to students learning in the existed literature (McCain, 2017; Engin, 2020; Khalid et al., 2021; Wang, 2022). This study then hypothesises that a teacher's growth mindset is positively associated with students' learning-related outcomes. In addition, teacher ecology model (Buehl & Beck's, 2014) (see Section 2.4.1) discussed teachers' teaching practice is deemed as being a compromise between various components, contextual factors may shape the manifestation of teachers' mindset feedback in the classroom. And indeed, previous studies found cultural orientation (Alexander, 2000) and school climate (Tubbs & Garner, 2008), as influential independent variables shaped teacher's actual teaching practice, even impacted on learning-related outcomes. Indeed, recent research (Rissanen et al., 2021) has highlighted that it is beneficial for teachers to be supported by the school environment in actualizing their implicit theory of

intelligence. This suggests that the school climate moderates teachers' teaching practices. This study then hypothesises that teachers' cultural orientation and school climate moderate the correlation of teachers' mindset beliefs and students' learning-related outcomes. See Section 2.4.1 for an elaboration.

1.4 Significance of the Study

From a theoretical perspective, this study is significant because it could provide one of the possible reasons for the inconsistent findings in the current growth mindset literature, which often neglects the essential role of contextual factors, and the alignment of teachers' mindset beliefs and actual mindset beliefs in teaching practice. By examining the relationship between teachers' growth mindsets, corresponding mindset feedback, and students' learning-related outcomes, this research provides empirical evidence on teachers' actual mindset feedback in classroom teaching practice, more, it offers a deeper understanding of how contextual variables—such as cultural orientation and school climate—moderate these relationships. It may challenge the prevailing assumption that growth mindset is universally effective, emphasizing the need for a more nuanced approach that accounts for local contexts. Additionally, the findings could help refine the theoretical framework of mindset studies by shedding light on how cultural and environmental factors shape the manifestation of mindset beliefs.

From a practical perspective, this study could provide valuable insights into the adaptation and application of growth mindset theory in educational settings, particularly in non-Western contexts such as Mainland China. These findings could guide the development of more targeted and culturally responsive growth mindset interventions, significantly enhancing their practical effectiveness and overall impact. These insights may guide schools and policymakers in developing strategies that integrate both teachers' implicit theories of intelligence and the cultural factors that influence their teaching practices, ultimately

fostering a more supportive learning environment and improving student learning-related outcomes.

1.5 Thesis Overview

To explore and address the research questions outlined in Section 1.3, this thesis is structured into five chapters, each serving a specific purpose in presenting key theories, methodologies, data, findings and others. Specifically, the first chapter provides the research background, primarily explaining why the present study is being conducted. The second chapter offers a comprehensive literature review covering implicit theories of intelligence, teachers' beliefs about intelligence, feedback influenced by teachers' mindsets, contextual factors including individual's cultural orientation and perceived school climate. This literature review lays the theoretical groundwork and contextual basis for the research. The third chapter delves into the methodology adopted in this thesis, detailing the researcher's perspective, methodological choices, sample size, participant recruitment, and ethical considerations including participant access, data confidentiality, and a pilot study overview. The fourth chapter presents both quantitative and qualitative results. In the fifth chapter, the findings are discussed in relation to the research questions and the literature from Chapter 2, utilizing previous research to support these findings, followed by discussion, implementation and recommendations for future study. Additionally, tables, figures and appendixes are included, providing supplementary materials that support the main text.

1.6 Summary

The present study has revealed a gap in the extant literature, namely the limited research on exploring teacher's mindset belief and their actual mindset feedback in teaching practice, and the relationship between teacher's mindset belief and student's learning-related outcomes, particularly when considering cultural orientation and perceived school climate. The study has advocated for further investigation aimed at scrutinizing the cross-cultural

applicability of growth mindset and exploring the realization of teachers' mindset feedback in the classroom by adopting a multipronged methodology. The study posits that China, with limited research on the impact of growth mindset in this cultural milieu, provides an optimal research context for such inquiries.



Chapter 2: Literature Review

2.1 Introduction

This literature review presents an overview of the academic literature related to implicit theory, its application to intelligence, its relation to cultural orientation and perceived school climate, and its implementation in the context of teachers. The review is structured around three primary themes that contribute to the existing literature. The first theme of this discussion involves an examination of common-sense psychology and scientific psychology, with a focus on the emergence of implicit theory. This section elucidates the theoretical underpinnings of growth mindset and employs it to analyse a layperson's perception of intelligence and corresponding behavioural patterns. The second theme centres on the application of growth mindset in the field of education, specifically how it impacts teachers' beliefs about intelligence and teaching practices, how cultural orientation and perceived school climate influence teacher's mindset belief formation, and the relationship between teachers' growth mindset and students' learning-related outcomes. The final theme derived from the preceding sections highlights certain limitations and potential remedies, emphasising the necessity to explore the efficacy of growth mindset in non-Western societies using diverse research methods. This section concludes by proposing the research questions that derived from the research gap identified in this literature review.

2.2 The Genesis of the Implicit Theory

Prior to delving into the discussion on growth mindset, it is pertinent to highlight its origins and its comprehensive portrayal of the implicit theory, which enables scholars to comprehend the significance of applying the implicit theory to intelligence. To this end, two helpful concepts, namely scientific psychology and common-sense psychology, can be introduced to provide background information on the implicit theory. These two forms of

knowledge exist within the field of psychology (Kelley, 1992), albeit differing in terms of subject matter, object of study, and presentation. Scientific psychology is predominantly based on the psychologist's perspective of analyzing, summarizing, and drawing conclusions on a psychological phenomenon and the resulting behavior, culminating in the formulation of a systematic research theory to explain the formation of that psychological phenomenon. Psychologists' research typically necessitates an objective outlook to uncover the fundamental truth of the matter, independent of personal values and subjective factors. In contrast, common sense psychology refers to non-researchers' cognitive logic about self-behavior and the development of objective things, thereby creating variability among individuals, which occurs in relation to other attributes that affect individual characteristics, such as one's cultural traits.

Common sense psychology provides a valuable contribution to the understanding of intelligence by exploring lay people's beliefs that scientific psychology may not capture due to its emphasis on objectivity and consistency. Common sense psychology allows for a consideration of subjective perspectives, which may be necessary to fully comprehend the complexity of human beliefs and behaviors. As Heider (1958) stated regarding common sense psychology "We might use common sense psychology to advantage in the development of hunches and concepts" (p. 7). Or in Kelly's (1995) view, everyone is a psychologist since the ability to analyse, interpret and predict the development and possible outcomes of things is not limited to psychologists. Common sense psychology broke through the idea that laymen are not just in a passive position to be observed by psychologists but are subjects capable of self-constructing their own mental world. Simply speaking, common sense psychology functions unconsciously, shaped by inner factors, thus it reveals the mechanics of the inner world of the individual, and it pursues an exploration of the particulars of the individual.

2.2.1 The Concept of Implicit Theory of Intelligence

Common sense psychology offers insight into how the average person perceives their mental processes and behaviors. Dweck's work (1999; 2006) expands upon this concept by exploring the subjective nature of an individual's beliefs about intelligence. She focuses on how implicit beliefs about intelligence can shape an individual's goals, behaviors, and self-esteem in both positive and negative ways. Specifically, Dweck's early research was inspired by Ellen Leggett's work (1985), which explored how individuals unknowingly learn about their own intelligence and abilities through their experiences and interactions with their environment. In her seminal study, Dweck (2006) embarked on a practical observation of student behaviors by categorizing them into two distinct groups based on their mindset towards intelligence. One group embodied a growth mindset, characterized by high motivation and a belief in the malleability of intelligence, while the second group held a fixed mindset, viewing intelligence as a static trait. Both groups faced the same set of challenging academic tasks, providing a direct comparison of their reactions to adversity. Remarkably, the students with a growth mindset displayed resilience and courage, actively engaging with the challenges presented to them. In contrast, those with a fixed mindset tended to retreat from the difficulties, showing a reluctance to persevere. This observational study shed light on a critical aspect of learning: it is the students' perception of their intelligence, rather than their actual intellectual capacity, that significantly influences their academic performance and approach to learning. Through this, Dweck underscored the profound impact of mindset on students' success and their ability to confront challenges. Dweck's groundbreaking research, rooted in practical observations of student behavior, laid the groundwork for a deeper exploration into the underlying cognitive frameworks that govern such responses. This shift from empirical observation to theoretical development marks a significant progression in her work, bridging the gap between individual behavioral patterns and the broader social cognitive theories that explain them. As this study delves into the expansion of the implicit

theory of intelligence, it is essential to recognize the foundational theories and constructs that have influenced and enriched Dweck's approach, offering a more intricate understanding of how beliefs about intelligence shape people's learning and behavior. Dweck's expansion of the implicit theory of intelligence in 1999 was a development grounded in an array of social cognitive theories and personal constructs, encompassing diverse viewpoints. To fully appreciate the systematic nature of this implicit theory, the following section provides an overview of the foundational theories that underlie and inform it.

Triadic Reciprocal Determination (TRD). The concept of Triadic Reciprocal Determinism (TRD), introduced by Bandura in 1986, offers a comprehensive framework for understanding the intricate interplay among three pivotal factors: behavior, which encompasses an individual's actions and decisions; perceived environment, including cultural norms, laws, and policies; and personal characteristics, such as personality traits, motivation, and competence. This model posits that these elements are not isolated but dynamically interact, profoundly shaping an individual's beliefs and behaviors. Carol Dweck's seminal research in 1999 further explores this interplay within the context of beliefs about intelligence, emphasizing particularly the influence of perceived environmental factors. Her work sheds light on how individuals develop their beliefs about intelligence, influenced significantly by their interactions within their immediate and broader environment. For instance, the language used by teachers and parents, characterized by phrases that either emphasize innate ability ('you are so clever') or effort and perseverance ('you are so diligent'), plays a crucial role in guiding students towards adopting an entity or incremental theory of intelligence. This concept is underscored in studies like those by Rissanen et al. in 2019, which demonstrate how linguistic choices in educational settings can significantly impact a student's mindset. Furthermore, Dweck's research highlights the role of school climate, like their orientation, whether they prioritize academic performance or focus on

fostering qualities like resilience and perseverance in the face of challenges. Such an orientation may shape the development of both growth and fixed mindsets, affecting not only students but also teachers. This intricate web of interactions, as outlined by Dweck, drawing from the TRD model, illustrates that the formation of beliefs about intelligence is a complex process, influenced by the perceived contextual factors. Dweck's integration of TRD into her exploration of intelligence beliefs underscores the multi-faceted nature of belief formation and the significant role of the local context in shaping the understanding of intelligence. This comprehensive approach to understanding the development of beliefs about intelligence has far-reaching implications for educational strategies, suggesting that fostering a growth mindset requires a nuanced consideration of the interplay between behavior and perceived local context.

Achievement Goals. A foundational element in the early work of Dweck and her colleagues (Grant & Dweck, 2003), represent the targets or objectives individuals strive to attain and can be seen as the driving forces behind their motivation to succeed. These goals are critical in understanding how individuals approach learning and achievement tasks. In their seminal 1988 study, Elliot and Dweck introduced a nuanced classification of these goals into two primary categories: mastery goals, also known as task or learning goals, and performance goals, alternatively termed competence or ego goals. Mastery goals are centered around the desire to enhance one's competence, focusing on the intrinsic value of learning and personal growth. These goals are not just about achieving an outcome but more about the process of learning, understanding, and developing new skills. In contrast, performance goals are directed towards demonstrating one's competence or superiority over others, often driven by a need for external validation or recognition. This dichotomy in goal orientation is deeply intertwined with Dweck's broader theories on mindsets. According to the findings of Elliot and Dweck (1988), Individuals who hold an incremental theory of intelligence—the view that

intelligence and abilities can be improved and developed through effort—are more likely to pursue mastery-oriented goals. These individuals view challenges as opportunities for growth and learning, focusing on personal improvement rather than external validation. On the other hand, entity theorists, who perceive intelligence as a fixed trait, are more likely to endorse performance goals. Their focus tends to be on proving their inherent abilities and avoiding situations where they might fail or appear less competent. This distinction between mastery and performance goals has profound implications for educational practices and personal development strategies. It suggests that the type of goals individuals pursue can significantly influence their approach to learning and challenges, their resilience in the face of adversity, and ultimately, their overall achievement and satisfaction. Understanding this relationship between goal orientation and mindset offers valuable insights into how teachers and parents can nurture a growth-oriented approach in students, emphasizing the importance of effort, learning, and personal development over mere performance or external accolades. This distinction between mastery and performance goals also has important implications for understanding students' learning-related outcomes. Students who are oriented toward mastery goals may be more likely to demonstrate greater engagement, persistence, and intrinsic motivation, which could contribute to deeper learning and academic progress. Conversely, those with a focus on performance goals might prioritize external validation, potentially leading to higher stress levels or disengagement when facing challenges.

Attribution theory. It was initially proposed by Heider in 1958, provides insight on how people interpret and assign causality to their own and others' behaviors, fundamentally impacting subsequent responses and motivational orientations. This theory delves into the cognitive processes of attribution, where individuals assess the reasons behind actions and events, thereby shaping their reactions and future behavior. In the realm of educational psychology, Dweck and her colleagues, through seminal works such as those by Diener &

Dweck in 1978 and Dweck et al. in 1995, have significantly expanded the application of attribution theory, particularly in distinguishing between entity theorists and incremental theorists based on their responses to success and failure. Entity theorists, who view abilities as fixed and immutable traits, tend to ascribe failures to external, uncontrollable factors, often leading to a sense of helplessness and a fixed mindset where the possibility of growth or improvement is largely dismissed. For example, they might attribute a failure in academic endeavours to an inherent lack of intelligence, perceiving these traits as static and unalterable, thus fostering a belief system where external circumstances dictate success or failure. In contrast, incremental theorists, who believe in the malleability and development of abilities through effort and perseverance, are more inclined to attribute failures to internal, controllable factors. They typically perceive setbacks as opportunities for growth, attributing shortcomings to variables like insufficient effort or suboptimal strategies. This perspective engenders a proactive approach towards learning and self-improvement, where challenges are viewed not as insurmountable barriers but as stepping stones for personal development and mastery. This dichotomy in attributional styles, as elucidated by Dweck and her colleagues, highlights the profound influence of belief systems on motivation and behavior, underscoring the critical role of teachers and mentors in fostering growth mindsets. By encouraging attributions that empower learners to believe in their capacity for growth and learning, there lies a potential for transformative educational experiences, promoting resilience, adaptability, and a lifelong love for learning. This in-depth exploration of attribution theory, particularly its application in educational settings, offers invaluable insights into the complex interplay between mindset, motivation, and learning outcomes, contributing significantly to the discourse on effective teaching and learning methodologies.

Self-efficacy. It is a concept introduced by Bandura in 1994, is a critical psychological construct that refers to an individual's belief in their own ability to successfully execute tasks

and manage prospective situations. The belief in one's own competence critically shapes how individuals engage with tasks, sustain effort when encountering difficulties, and respond to the results of their actions. Within the framework of implicit theory, self-efficacy is a determinant factor that influences not only the approach towards task performance but also the emotional and cognitive responses to the results of these tasks. The relationship between self-efficacy and implicit theories of intelligence, as explored by Dweck and Bempechat in 1983, reveals intricate dynamics, especially in how self-efficacy impacts the behavior of entity theorists when confronted with challenging tasks. For entity theorists, who perceive intelligence and ability as fixed traits, a low sense of self-efficacy can lead to a tendency to shy away from tasks that are perceived as challenging or beyond their inherent capabilities. This avoidance is rooted in a fear of negative judgments or affirmations of their perceived fixed competencies. In situations where they do engage with difficult tasks and encounter failure, entity theorists with low self-efficacy are prone to experience learned helplessness, a state where they attribute their failure to unchangeable factors like inherent lack of ability, rather than variables they can control or improve upon. This sense of helplessness further reinforces their belief in fixed intelligence and undermines their motivation to engage in or persist through challenging tasks. Consequently, variations in self-efficacy may play a critical role in shaping students' learning-related outcomes.

Building upon four foundational theories that have significantly shaped the understanding of cognitive development, motivation, and learning-related outcomes, Dweck et al., in their landmark 1995, 2006 study, articulated two distinct theories of mindset: the entity theory and the incremental theory of intelligence. These theories represent a culmination of insights drawn from extensive psychological research, providing a nuanced understanding of how individuals perceive their intelligence and abilities. The entity theory, as proposed by Dweck and her colleagues (1995, 2006), posits that intelligence is perceived

as a fixed trait, a set of predetermined characteristics that are largely unchangeable. In this view, an individual's ability to perform a task is seen as inherently pre-determined; if they believe that a task is within their set abilities, they approach it with a sense of certainty and confidence. However, if they perceive the task as beyond their innate capabilities, they are likely to experience a significant decrease in their perceived likelihood of mastering it. This mindset often leads to what Dweck describes as learned helplessness, particularly evident in her 2006 discussions, where the anticipation of failure due to perceived fixed intelligence results in a defeatist attitude and avoidance of the task.

Contrastingly, the incremental theory of intelligence, another key outcome of Dweck's (2006) synthesis of foundational theories, advocates that intelligence is a malleable quality that can be developed and enhanced through effort and persistence. This perspective shifts the focus from pre-existing abilities to the potential for growth, emphasizing that sustained effort, the application of effective strategies, and a strong motivation are the true determinants of one's capability to perform a task. This approach encourages a growth-oriented mindset, where challenges are viewed not as insurmountable obstacles but as opportunities for learning and self-improvement. The clear demarcation between these two theories – entity and incremental – lies in the perception of intelligence: static and unchangeable versus dynamic and capable of development. Dweck's exploration into these mindsets provides a transformative lens for viewing intelligence, not as a fixed attribute but as a potential that can be cultivated through one's actions and choices. This mindset shift has profound implications for educational practices and personal development strategies, fostering an environment where growth, adaptability, and a commitment to lifelong learning are prioritized. In essence, the delineation of entity and incremental theories of intelligence, grounded in Dweck's assimilation of foundational theoretical perspectives, offers a comprehensive framework that fundamentally reshapes the understanding of cognitive abilities and the potential for human

growth and development.

Dweck's groundbreaking work in 1999 and 2006, which is not only academically significant but also accessible and highly relevant to laypeople, marks a substantial contribution to the field of psychology by applying epistemological beliefs to the conceptualization of intelligence. This approach delves into the intricate nature of beliefs about the structure, stability, and certainty of knowledge, effectively bridging complex psychological theories with everyday understanding. It addresses pivotal questions that resonate with both scholars and laymen alike, such as how an individual perceives intelligence, the underlying reasons for success or failure, and the profound impact of these beliefs on oneself and one's interaction with the environment. At the heart of this theoretical framework lies the essential concept of beliefs about intelligence, a notion that Dweck, in collaboration with Yeager in 2019, has dissected into two distinct yet interconnected perspectives: the incremental view and the entity view of ability.

The incremental view posits that intelligence and ability are dynamic and malleable, challenging the traditional and often layman's notion that intelligence is a fixed, unchangeable trait. This perspective views intelligence as the sum total of expanding skills and knowledge, contending that through effort and perseverance, intelligence can be developed and increased. This viewpoint resonates with individuals who adopt a growth mindset, leading them to establish learning goals with the aspiration of enhancing their abilities through continuous study and practice. They are characterized by a robust inner motivation to learn, a focus on the process of problem-solving, and a willingness to adopt effective learning strategies, rather than fixating on immediate results such as test scores. This mindset promotes the belief that growth and development are achievable, thereby building resilience when facing setbacks or failures. Individuals who embrace this view perceive setbacks not as threats to their competence or self-worth but as vital opportunities for

learning, growth, and self-improvement.

On the other hand, the entity view, which might initially appear more intuitive to the layman, advocates that intelligence is a stable, unchangeable trait, firmly rooted in genetic factors and environmental conditions. This fixed mindset leads individuals to establish performance goals, driven by a desire to validate their intelligence in the eyes of others rather than focusing on personal growth and development. Such individuals are inclined to gravitate towards tasks that showcase their existing skills, avoiding new challenges and the inherent risks of failure. Their approach to effort is influenced by a belief that failure is fundamentally unacceptable, irrespective of the amount of effort invested. As a result, they tend to engage in tasks that are well within their comfort zone, opting for very easy goals to minimize the risk of failure and avoid the frustration and perceived threat to their self-esteem that failure might bring.

Dweck's exploration of these mindsets, particularly in how they manifest in everyday life and academic settings, offers profound insights into the psychological mechanisms underpinning learning and achievement. Her work illuminates how individuals' beliefs about intelligence profoundly shape their learning strategies, capacity to cope with difficulties, and levels of motivation and involvement in educational activities. This understanding, crucial for teachers, psychologists, and laypersons, highlights the importance of fostering a growth mindset to encourage a culture of continuous learning, adaptability, and a proactive approach to personal and academic challenges. The dichotomy of the incremental and entity views of intelligence, as elucidated by Dweck (1999, 2006), not only contributes to the academic discourse in psychology but also provides practical, accessible insights for people from all walks of life, emphasizing the transformative power of people's beliefs in shaping their learning journeys and life paths.

2.2.2 The Application of Growth Mindset

Dweck's extensive research on mindset, particularly her collaborative work with Yeager in 2019, profoundly highlights the practical implications of one's adopted mindset, emphasizing how beliefs about intelligence can wield significant influence, leading to either positive or negative outcomes for individuals and their interactions with others. The practical application of these mindsets' manifests in distinct ways, often conditioned by societal norms, educational practices, and familial influences. For instance, negative stereotypes, such as the pervasive but unfounded belief that girls are inherently less skilled in mathematics, can deeply impact students from a young age. These societal preconceptions, often perpetuated by teachers, parents, and peers, can subtly but significantly limit a student's perceived potential, leading them to internalize these biases and develop a fixed mindset. This fixed mindset reflects the belief that intelligence is innate, static, and resistant to change, typically results in students setting performance goals that align with these ingrained stereotypes. Consequently, setbacks and failures in this mindset often lead to a loss of self-confidence and the adoption of performance avoidance goals, such as the fear of being the worst or achieving the lowest score. This vicious cycle reinforces the negative stereotypes, perpetuating a belief in personal inadequacy ('I can't do well'), ultimately leading to disengagement from the task and forfeiting opportunities for growth and development.

Dweck and her colleagues, in their quest to elucidate the practical implementation of mindset, particularly the mindset belief in intelligence, have delineated two distinct motivation models that drive individuals' pursuit of intellectual achievement: the helpless pattern associated with entity theory adherents and the mastery-oriented pattern embraced by supporters of the incremental theory. The helpless pattern, as described in works by Cain & Dweck (1995) and Dweck (1998), refers to the negative reactions exhibited by individuals when confronted with failure. This pattern includes a range of responses such as a decline in self-esteem, lowered expectations, negative emotions, reduced persistence, and an ensuing

drop in performance. Individuals who exhibit this pattern often measure their abilities solely by their achievements, and failures are internalized as reflections of their innate lack of intelligence. This leads to a learned helplessness response, where individuals feel powerless to improve or change their situation. In contrast, the mastery-oriented pattern, also explored in Dweck's 1998 research, emphasizes the critical role of effort and adaptive strategies when encountering setbacks or failures. Individuals with this mindset demonstrate persistence, actively seek new problem-solving strategies, and are more concerned with the application of learning strategies and the improvement of their abilities. When faced with failure, instead of attributing the setback to a lack of intelligence, they tend to double down on their efforts, leading to a mastery-oriented response.

In all, Carol Dweck's research culminates in a detailed sequence of intellectual beliefs and their corresponding behavioral patterns, showcasing the profound influence of mindset on judgment formation, individual behavior, and stereotyping. She differentiates between two primary theories of intelligence: the entity theory, which predisposes individuals to performance goals leading to learned helplessness, and the growth theory, steering individuals towards learning goals and mastery-oriented responses. Dweck's work, particularly highlighted in her 2006 study, further explores how these mindsets manifest in responses to five critical aspects – challenges, obstacles, efforts, criticism, and the success of others, each divided into seven factors. These aspects and factors, as systematically outlined in her research, are visually depicted in Figure 2. To fully appreciate and acknowledge the systematization of Dweck's Theory of Mindset, these aspects and their corresponding factors have been outlined in the following sections, providing a detailed framework for understanding the profound influence of mindset on various dimensions of behavior and thought processes.

Challenges: Dweck (2006) and Hochanadel & Finamore (2015) illustrate that

individuals with a fixed mindset often avoid challenges, believing they lack the necessary skills or intelligence. For instance, a student with a fixed mindset might steer clear of advanced science classes, perceiving them as beyond their capabilities. In contrast, those with a growth mindset view challenges as opportunities for growth and learning. This student, despite initial struggles in science, might seek additional help or dedicate more time to study, seeing these challenges as a way to improve and grow.

Obstacles: Bates (2016) notes that for people with a fixed mindset, obstacles can seem insurmountable, often leading to withdrawal and resignation. In a professional setting, such an individual might give up on a complex task at the first sign of difficulty. On the other hand, those with a growth mindset, as Dweck (2006) explains, persevere in the face of obstacles. They view setbacks as an integral part of the learning process and are more concerned with what they can learn from the experience rather than the immediate outcome. For example, an entrepreneur with a growth mindset might view initial business failures as valuable lessons and opportunities for refinement.

Efforts: In the view of individuals with a fixed mindset, effort is seen as unnecessary or even counterproductive, as Dweck and Yeager (2019) discuss. They believe that success should come naturally if they are truly capable. For instance, a musician with a fixed mindset might rely solely on their natural talent and avoid rigorous practice. Conversely, those with a growth mindset value effort as a vital component of success and personal development. The same musician, with a growth mindset, would embrace consistent practice as essential to honing their skills and achieving mastery.

Criticism: People with a fixed mindset often perceive criticism as a personal attack or a direct challenge to their abilities, as detailed by Dweck (2006). They might respond defensively or dismiss feedback entirely. For example, an artist with a fixed mindset might reject constructive criticism, viewing it as a negation of their talent. In contrast, those with a

growth mindset welcome feedback as a means to improve and grow. They use criticism constructively, adapting their approach and strategies in response. This artist might see feedback as a valuable tool for artistic development and experimentation.

Success of Others: Campbell & Collier-Reed (2020) discuss how individuals with a fixed mindset often view the success of others as a threat, feeling overshadowed or diminished by others' achievements. For example, in an academic setting, a student with a fixed mindset might feel demoralized by a peer's academic success, perceiving it as a reflection of their own shortcomings. In contrast, those with a growth mindset see others' success as inspirational and a source of valuable learning. A student with a growth mindset may interpret a peer's success as an opportunity to learn effective study strategies or as an inspiration to enhance their own learning performance.

According to the preceding elucidation, individuals with a fixed mindset perceive and interpret events through the lens of their assumed intellectual capacity, maintaining a belief that effort is ineffectual in altering outcomes. In stark contrast, those possessing a growth mindset actively seek efficacious methodologies, dedicating considerable effort towards the attainment of their goals. The concept of growth thinking, as propounded by Dweck in 2006, offers a framework for examining divergent worldviews from a human-centric perspective, positing that the manner in which individuals think wields limitless potential. Individuals ingrained with a growth mindset are postulated to have an augmented likelihood of future success, contingent on adequate support, and sustained hard work. This exploration into the practical application of the growth mindset delineates that an individual's intellectual beliefs not only shape their internal self-conceptions but also significantly mold their tangible actions and reactions within real-world scenarios. Dweck's pioneering work highlights the profound influence of deeply entrenched mindsets, extending beyond solitary cognitive processes to significantly affect interactions with external challenges, obstacles, and interpersonal

relations. The demarcation between fixed and growth mindsets transcends mere theoretical discussion, manifesting in a tangible manner in how individuals approach challenges, recover from setbacks, value effort, interpret criticism, and view the successes of others. Furthermore, the importance of a growth mindset extends beyond individual accomplishment, influencing communal and societal mindsets. Societal stereotypes and limiting beliefs, often perpetuated inadvertently, can be actively countered by inculcating a growth mindset from an early age. Dweck's theoretical construct underscores the potent influence of mindset as a determinant of behavior, where a shift in mindset can initiate transformative changes in an individual's life path and influence others. Consequently, the concept of a growth mindset has found significant application in the field of education, reshaping pedagogical strategies and classroom dynamics. This application is predicated on the understanding that teachers' mindsets can profoundly impact not only their teaching practice but also the learning-related outcomes of their students.

While, in theory, a growth mindset is expected to produce positive outcomes, recent empirical research and meta-analyses have revealed counter-intuitive findings and underscored the importance of context. Although academic outcomes are not the central concern of this study, existing literature reports inconsistent findings, highlighting the need to consider contextual heterogeneity. For example, King and Trinidad (2021) found that although a growth mindset positively predicted motivation and engagement across all socioeconomic groups, it only had a positive effect on academic achievement among students from more advantaged families, highlighting the moderating role of socioeconomic status. Similarly, McCabe et al. (2020) observed in a longitudinal study that growth mindset did not yield measurable improvements in academic success or student retention among first-year university students. Sun et al. (2021) compared US and Chinese students and found that while growth mindsets were positively related to academic outcomes for US students, the

association was slightly negative for Chinese students, emphasizing cultural differences in how intelligence mindsets relate to academic success. Supporting these empirical studies, several meta-analyses have also reported inconsistent results. Bardach et al. (2024) found only small, statistically significant associations between teachers' growth mindsets and motivational outcomes, with no significant impact on teachers' performance goals or student achievement. Macnamara and Burgoyne (2023) reviewed studies linking growth mindset to academic achievement and reported that the overall effect size was small and became non-significant after accounting for potential biases, indicating that the benefits may have been overstated due to methodological limitations. Burnette et al. (2023) further highlighted the variability in growth mindset effects, showing that their impact is highly contingent upon contextual factors such as the characteristics of the target population and the consistency of implementation. The cultural sensitivity of the growth mindset has been increasingly highlighted in recent empirical research, particularly in the field of education. For example, Yeager et al. (2021) demonstrated that growth mindset interventions tend to be more effective in classrooms where teachers themselves endorse growth-oriented beliefs, lending support to the mindset-plus-supportive-context hypothesis. While this finding was situated within an intervention framework, it also suggests that the efficacy of growth mindset—whether externally induced or naturally held—depends heavily on the surrounding social and cultural context, particularly the degree of alignment between individual beliefs and environmental cues. Further research by Kroeper et al. (2022) explored how specific teaching behaviors communicate instructors' growth or fixed mindset beliefs to students, finding that behaviors such as encouraging all students to learn, providing feedback opportunities, and emphasizing learning over performance help foster perceptions of a growth mindset. In a more recent study, Zhang and He (2024c) found that the perceived school climate, such as school resources and decision making significantly moderates the link between teachers' growth

mindset and their level of work engagement.

The following section will continue to explore the application of growth mindset in teachers' teaching scenarios, examining their mindset, specific teaching practice and the translation between them.

2.3 The Application of Growth Mindset in Teachers' Teaching Scenario

Teachers have been considered as one of the most powerful influencers in students' learning with their specific teaching practice. As what Hattie and Timperley (2007) suggested, the teaching methods employed by teachers are highly influential in enhancing students' learning. These methods play a pivotal role in helping students narrow the gap between their current understanding and the level they aspire to achieve. In terms of teachers' adoption of growth mindset, a key aspect of this approach is the incorporation of the growth mindset into teaching practices. This involves a focus on teachers' beliefs about intelligence and the feedback they provide based on these beliefs, examining how this feedback relates to students' learning-related outcomes. In the classroom setting, the language used by teachers can significantly shape a student's beliefs about their own intelligence. For instance, when a teacher comments, "it's too difficult for you," it inadvertently reinforces the notion of intelligence being a fixed, innate ability. Conversely, encouraging statements like "you need to put in more effort" highlight the crucial role of effort and perseverance in achieving success. Alternatively, adopting a neutral approach with comments such as "take it slow" avoids implying any fixed belief about the student's ability or effort, as discussed by Rissanen et al. in 2019. Further empirical research, involving a substantial number of students ($n = 2200$) and teachers ($n = 358$), as indicated by Yu et al. in 2022, supports this finding. This research highlights the strong connection between the growth mindset-oriented teaching feedback teachers provide and the cultivation of a growth mindset in students. This correlation highlights the profound impact of teacher feedback on shaping student

perceptions and attitudes towards learning.

Additionally, the research of Yeager et al. in 2022 brings to light the role of context in the application of teachers' feedback regarding intelligence. More recent study (Zhang & He, 2024a) further highlighted the extent to which teachers form their beliefs about intelligence was influenced by their perceived local contextual factors. This finding points to the nuanced nature of how teachers' beliefs are affected by the local environment in which they operate. Section 2.4 of this discussion will delve more deeply into the role of context in shaping teachers' feedback on intelligence. Meanwhile, the current section provides an extensive literature review on teachers' implicit theories of intelligence. This review starts with a model that helps in understanding the socialization of intelligence beliefs, setting the stage for a comprehensive exploration of how teachers' mindset beliefs may have an influence on students in teaching scenario. This review begins by introducing a theoretical model that facilitates the understanding of how intelligence beliefs are socialized in educational settings. Dweck's (2006) implicit theory of intelligence primarily addresses the intra-personal domain, explaining how individuals' beliefs about the malleability of intelligence influence their own motivation and behavior. However, the current study expands this perspective by applying it to the interpersonal context of teacher-student interactions. This theoretical extension is grounded in Bandura's (1986) TRD, which posits that personal factors, behavior, and environmental conditions continuously interact with and influence one another. Within this framework, teachers' mindset beliefs can be seen as personal factors that shape their instructional behavior, such as the type of feedback they provide, while simultaneously being influenced by the broader classroom environment and student reactions. By adopting this perspective, it becomes possible to explore how teachers' beliefs about intelligence are communicated through language and practice, and how these beliefs are interpreted and internalized by students. The integration of Dweck's (2006) implicit theory of intelligence

with Bandura's (1986) TRD thus offers a robust conceptual foundation for analyzing the complex social processes through which intelligence beliefs are enacted and transmitted in classroom settings.

The Hypothesised Model for the Socialisation of Implicit Theories of Intelligence (HMSIT), proposed by Haimovitz and Dweck in 2017 and depicted in Figure 3 (p. 1856), serves as an exemplary framework for understanding the process through which teachers' implicit beliefs about intelligence, or other related beliefs, can foster the development of either a growth or fixed mindset in students. This model is a crucial contribution to the understanding of the dynamics at play in educational settings, particularly regarding how teachers' beliefs about intelligence are reflected in their language and teaching practices, subsequently influencing their students' learning-related outcomes. According to the HMSIT, a student's performance, whether characterized by success or failure, acts as a catalyst that activates a teacher's underlying beliefs about intelligence. These beliefs, in turn, shape the way teachers frame their feedback—whether it emphasizes effort or innate ability—in response to these academic events. For instance, when a student exerts considerable effort to surmount learning challenges, a teacher's response might be influenced by their belief in incremental intelligence (e.g., praising the student's diligence) or a motivational belief (e.g., commending the student's hard work and potential for reward). This response is crucial, as it not only acknowledges the student's effort but also communicates the teacher's belief about what they consider most motivating for the student. The subsequent stage in this model involves the teacher's choice between process-oriented or person-oriented practices in response to the student's performance. This choice is again shaped by the teacher's intelligence belief and plays a significant role in promoting either a growth or fixed mindset in the student. A person-oriented approach, which aligns with the socialization of an entity belief, typically highlights the student's innate intelligence (e.g., “you are clever”), suggesting

that their success is a result of fixed, inherent traits. In contrast, a process-oriented approach aligns with fostering an incremental belief environment and focuses on praising the student's efforts and strategies (e.g., "you are a hard worker"). This approach emphasizes that success is a result of perseverance and learning, rather than innate ability alone.

Through this model, Haimovitz and Dweck (2017) suggest that the approaches and language used by teachers can profoundly impact students' mindsets and their learning-related outcomes. The Hypothesised Model for the Socialisation of Implicit Theories of Intelligence underscores the importance of teachers adopting practices that encourage a growth mindset, highlighting the critical role teachers play in shaping not just academic achievement but also the underlying beliefs that students develop about learning, intelligence, and their own capabilities. More, this model elucidates the mechanisms through which teachers' growth mindset and mindset feedback significantly influence children, highlighting the pivotal role teachers play in shaping student perceptions of their own intelligence.

Building on the foundational model proposed by Haimovitz and Dweck (2017), subsequent literature has further validated the significant impact of teachers' growth mindsets on their teaching practice and, consequently, on student learning-related outcomes. For example, Laine et al. (2016) provided empirical evidence suggesting that teachers who embrace a growth mindset tend to adopt teaching methods that not only recognize but also actively nurture students' abilities. This approach leads to a more flexible and encompassing educational experience, where students are encouraged to view their intelligence and skills as qualities that can be developed over time. Moreover, Schmidt et al. (2015) found that the positive influence of growth mindset on students was significantly amplified when teachers themselves held strong beliefs in the malleability of intelligence. Similarly, Bonne and Johnston (2016) observed that instructors who exhibit a growth mindset not only contribute to a positive learning environment but also significantly enhance their students' self-efficacy

and confidence. One more recent research found that teachers' growth mindset positively moderated the relationship between students' growth mindset and academic achievement (Zhang & He, 2025). Those research collectively highlights the importance of giving consideration on the role of teacher when applying growth mindset in teaching scenario, referred to as the mindset-plus-supportive-context hypothesis (Yeager et al., 2021). Central to this mindset-plus-supportive-context is the mindset of the teachers, whose beliefs about intelligence and learning significantly influence both their teaching practices and the learning-related outcomes of their students.

Based on the above discussion, teachers' beliefs about intelligence could affect how they respond to student success and failure, such as the language they use in the classroom. Such teaching practice, in turn, has a profound impact on students' perceptions of their own abilities, their approach to learning, and their resilience in the face of challenges and so on, finally their learning-related outcomes. Teachers who embody a growth mindset not only cultivate a classroom environment that values effort and persistence, but also model through their practices the belief that intelligence is a malleable trait that can be developed over time. Continuing from this premise, the study will next delve into a detailed examination of the specific teachers' mindset feedback in teaching practice by reviewing the existing literature. This exploration aims to illustrate the specific ways in which teachers with different mindset beliefs convey their perspectives through language.

2.3.1 Specific Mindset Feedback in Teaching Practice

Regarding the specific application of teaching practices in the classroom, Table 1, which will be presented in the following, compiles and presents a range of feedback examples from teachers as observed and documented in relevant academic literature. This table is meticulously designed to offer readers tangible, real-life instances of how teaching practices can manifest either a growth or a fixed mindset within an educational setting.

Drawing from extensive research, particularly the studies conducted by Rissanen et al., (2018a; 2019) and Zhang & He (2024b), the table outlines the key distinctions among entity feedback, neutral feedback, and incremental feedback in the context of teaching practice. Entity feedback, as described in the literature, is typically associated with instructional approaches that emphasize performance outcomes—such as achieving high test scores or excelling in standardized assessments—and tends to attribute student success to innate abilities or fixed personal traits. In contrast, incremental feedback, grounded in a growth mindset framework, supports teaching practices that emphasize the cultivation of learning capacities. This type of feedback underscores the value of effort, persistence, and strategic learning, encouraging students to view their abilities as adaptable and continually evolving. Additionally, the table incorporates examples of neutral feedback—an often underexamined but important category—which involves language that neither promotes a fixed nor a growth mindset. Instead, neutral feedback delivers impartial, descriptive commentary on student performance or behavior without evaluative judgment, such as “take it slow” or “let’s review this part.” This type of feedback is essential as it provides a balanced approach that does not impose any specific mindset on the students but rather leaves room for their own interpretation and self-reflection.

Table 1 is particularly valuable for this study as it facilitates classroom observations through the lens of growth mindset theory. By presenting a diverse range of feedback examples, it allows for a more nuanced understanding of how teachers’ beliefs and teaching practices can influence students’ mindset and learning outcomes. This table not only serves as a guide for teachers to reflect on and enhance their teaching methods but also provides a framework for researchers to analyze the impact of different feedback types on fostering a conducive learning environment.

Dweck’s work (1999; 2006) considered those teaching practices as the socialization of

intelligence beliefs, reflecting the notion that teachers' mindsets are conveyed to students through their language, and subsequently influence their learning-related outcomes. These practices, far more than mere instructional methods, represent a deeper underlying belief system about intelligence that teachers hold. The table of teachers' mindset feedback, as detailed earlier, exemplifies this concept by categorizing various types of feedback that teachers provide in the classroom, with each type being indicative of either a fixed, growth, or neutral mindset. Teachers who use growth mindset language tend to foster stronger psychological resilience and persistence in their students, as shown by Skipper & Douglas (2012). In this approach, when students face challenges, they are encouraged to put more effort into their work or to adjust their learning methods. This aligns with the growth mindset philosophy, where difficulties are seen as opportunities for learning and improvement, and intelligence is viewed as a developable trait. In contrast, teachers whose language and feedback align with a fixed mindset can inadvertently lead students to develop a sense of learned helplessness, as highlighted in Dweck's studies (2006). This effect occurs when students begin to believe that their abilities are capped and that no amount of effort can overcome challenges that surpass their perceived limits of intelligence. Such a belief can significantly hinder a student's willingness to engage with challenging tasks and limit their overall academic growth. However, some teachers may provide neutral feedback, which neither explicitly reinforces a fixed nor a growth mindset (Dweck, 1999). For instance, comments such as "Just do your best" or "It's okay, take your time" do not necessarily encourage effort-based improvement but also do not suggest that ability is fixed. While neutral feedback may not directly contribute to learned helplessness, it may fail to actively promote a growth mindset, potentially leaving students without clear motivational guidance. In all, the way teachers communicate and interact with students plays a pivotal role in shaping their perceptions of intelligence and their attitudes toward learning. Teachers who are

mindful of their language and consciously adopt a growth mindset can create a more positive and encouraging learning environment. This environment not only supports academic achievement but also fosters a belief in students that their abilities and intelligence can grow and improve over time.

Expanding on the findings from empirical studies outlined in Table 1, this research emphasizes a structured categorization of teachers' classroom behaviors into three distinct types: 'entity feedback,' 'neutral feedback,' and 'incremental feedback.' This categorization is instrumental in dissecting the nuances of teachers' mindset feedback and understanding their impact on student learning and mindset development. Among these categories, while 'neutral feedback' tends to be less directive or instructive for students, lacking a clear implication of the teacher's stance on intelligence and ability, 'entity feedback' and 'incremental feedback' present more defined pedagogical approaches. These approaches can be aligned with what the literature describes as 'ability-focused pedagogy' and 'performance-focused pedagogy,' respectively. In detail, 'entity feedback,' as conceptualized in the literature, primarily underscores the translation of a student's inherent abilities into specific performance outcomes. This type of feedback focuses on the learning process and is often linked to the belief that a student's performance is a direct result of their innate intelligence or ability. For example, without considering variations across different subjects or student groups, when a teacher gives feedback that emphasizes a student's natural intelligence or talent in response to their success or struggle, it reinforces the notion that these traits are fixed and unchangeable. In contrast, 'incremental feedback' challenges this notion of fixed intelligence, placing the emphasis instead on the development and enhancement of a student's capabilities. This feedback approach is centered around the belief that with the right effort and strategies, students can improve and grow their abilities over time. It highlights the potential for improvement and development through dedicated effort and perseverance.

The way teachers provide feedback during students' encounters with learning challenges or in response to their efforts has a significant impact on how students perceive and internalize this feedback. As noted by Gutshall (2016), these feedback approaches can strongly influence students' alignment with either a growth or fixed mindset. 'Entity feedback' may lead students to believe that their abilities are static, which can limit their motivation to engage in challenging tasks. Conversely, 'incremental feedback' can foster a growth mindset in students, motivating them to persevere and strive for improvement. Subsequently, this divergence in feedback styles and the beliefs they reinforce play a crucial role in shaping students' learning-related outcomes. In the following sections, this research will continue to review the literature regarding the impact of teachers' growth mindset on students' learning-related outcomes.

Upon conducting a review of the literature concerning teachers' growth mindset, it was observed that the predominant method of evaluating teachers' implicit beliefs about intelligence has been self-reporting, predominantly through the use of a Likert-scale questionnaire, as developed by Dweck in 2016. This reliance on self-reporting methods has been notable particularly since the introduction and implementation of the growth mindset theory in tangible teaching environments (refer to Table 2 for examples). Nevertheless, there exists a notable dearth of scholarly evidence pertaining to the actualization of such beliefs within the dynamics of real classroom settings. This scarcity of empirical data introduces a degree of uncertainty about the potential misalignment between teachers' professed beliefs in intelligence and their practical instructional approaches. Relying solely on self-reported data to assess a teacher's mindset and the feedback they provide in the classroom context presents inherent risks. Buehl and Beck (2014) have highlighted the discrepancy that can arise between contemplated responses (empirical data) and authentic behaviors observed in situ (field data). Subsequent research, albeit limited, such as the study by Rissanen et al. (2019),

has employed a diverse array of methodologies, including questionnaires, interviews, and direct classroom observations. This approach has been instrumental in evaluating the implementation of growth mindset principles among Finnish teachers, yielding more comprehensive insights, particularly regarding teachers' genuine mindset feedback in a localized educational setting. The evident gap in existing literature has subsequently influenced the methodological framework of the current study. A mixed-methods approach was adopted, primarily for its ability to juxtapose direct field observations with self-reported data. Such a comparative analysis is instrumental in identifying potential disparities between teachers' declared beliefs and their actual behaviors in classroom settings. A thorough exploration of this methodological approach will be detailed in Chapter 3.

2.3.2 Learning-related Outcomes

Learning-related outcomes, as understood in educational psychology, are typically defined as the psychological and behavioral attributes or responses deeply intertwined with the learning process (Grant, et al., 2023; King, Wang & McInerney, 2022). In relation to this study, the examination on students' learning outcomes is highly connected to growth mindset theory, the selected variables include 1) learning motivation, it is conceptualized as the strategies and tactics employed by students, driven by intrinsic or extrinsic motivation, to enhance their learning effectiveness. This concept, as explored by Rao & Sachs (1999), reflects the ways in which students' motivation can directly affect their approach to learning. 2) learning self-efficacy, defined by Graham (2007) as an individual's belief in their capability to successfully engage in and accomplish specific learning tasks, is another key factor. It embodies the confidence students have in their abilities, significantly influencing their academic performance and willingness to take on challenging tasks. 3) learned helplessness, as described by Peterson (1993), refers to a psychological state where individuals perceive a lack of control over outcomes, leading to passive or defeatist attitudes

in learning scenarios. This state is critical in understanding how students' perceptions of their abilities and control over their learning environment can impact their engagement and achievement. And 4) learning engagement, which Halverson (2016) defines as the extent to which students are actively involved and invested in their learning process, is essential for understanding the dynamic interaction between individual factors, the environmental context, and behavioral actions in learning. Those four variables are integral within the framework of implicit intelligence theory. Their relevance extends beyond the individual student, intertwining with the growth mindset of both students and teachers. This interplay can be understood through the foundational theories underpinning growth mindset theory, as detailed in Section 2.2.1. The following discussion will elaborate on these theories.

Learning motivation and learning self-efficacy, rooted in the theory of achievement goals (Grant & Dweck, 2003) and the theory of self-efficacy (Bandura, 1994), respectively, reflect an individual's drive and belief in their capability to achieve academic success. However, these aspects of a student's learning experience are not solely influenced by their personal traits or motivations. They are also significantly impacted by the educational environment, particularly by teachers' mindsets and approaches. A teacher with a growth mindset can positively influence students' motivation and self-efficacy by reinforcing the belief that abilities and intelligence can be developed through effort and perseverance. Similarly, learned helplessness, a concept underscored in attribution theory (Heider, 1958), explores how individuals attribute their success or failure to factors within or beyond their control. In a classroom context, the feedback and attitudes of teachers, particularly those embodying a fixed or growth mindset, can influence whether students attribute their academic challenges to unchangeable personal deficiencies (fixed mindset) or to modifiable strategies and efforts (growth mindset). Learning engagement, defined as the extent of students' active participation in the learning process, is also shaped by the dynamic

interaction between individual characteristics and environmental influences, as proposed by TRD (Bandura, 1986). Teachers' mindsets and teaching strategies play a pivotal role in fostering an engaging learning environment. A growth mindset teacher, who focuses on effort, strategy, and improvement, can create a classroom culture that encourages active participation and engagement, motivating students to immerse themselves more deeply in their learning journey.

This study acknowledged that comparing to extensive research has been conducted on the relationship between students' growth mindset and their learning-related outcomes, the influence of teachers' growth mindset on these outcomes has remained relatively underexplored in existing research. Despite the growing recognition in the literature of teachers' growth mindset as a causal factor in fostering a similar mindset among students, its role in promoting positive learning-related outcomes remains underexplored (Mesler et al., 2021; Yeager et al., 2022), calling for further research on addressing the relation between teachers' growth mindset and students' learning-related outcomes. Thus, it motivates the present study on examining how teachers' growth mindset could have an influence on students' learning-related outcomes.

2.4 Contextual Factors in Growth Mindset Theory

A significant critique of the growth mindset theory centers on its paradoxical results in forecasting positive academic outcomes. More, the majority of successful studies supporting this theory have been conducted in Western contexts, while attempts to replicate these findings in non-Western settings have often not yielded the same successful results. For instance, Yeager et al.'s nation-wide study (2019) confirms the beneficial effects of believing in the ability to develop intelligence and skills through consistent effort and perseverance on academic achievement in the USA. A comparative study between the US and China revealed a marked association between a growth mindset and mathematics scores among American

students, while, intriguingly, this relationship was inversely observed in Chinese students (Sun et al., 2021). Similarly, research by Li and Bates (2019) indicated a lack of significant correlation between the mindsets reported by Chinese students and their academic grades or cognitive performance. Further, Yeager et al.'s analysis of the 2018 PISA data revealed a positive relation between a growth mindset and academic outcomes in 73 countries but not in China (including Hong Kong), where a significant negative correlation was observed between students' growth mindset and their academic performance. These empirical studies collectively suggest a widespread finding on the contextual sensitivity of the growth mindset. In relation to this study, the next section focuses on the contextual sensitivity of growth mindset theory, particularly in relation to teachers' growth mindset. This discussion will further explore how individual's cultural orientation and perceived school climate may shape the formation of teachers' mindset beliefs, providing a more comprehensive understanding of the dynamics at play.

2.4.1 Contextual Factors Influence Teachers Mindset Beliefs' Formation

The formation of teachers' mindset beliefs is deeply embedded within their perceived contextual realities—a perspective that can be traced back to Nespor's (1987) seminal work. Rather than treating beliefs as static or purely individual constructs, Nespor (1987) emphasized the context-specific nature of belief systems, highlighting how teachers' beliefs are shaped through their interpretations of systemic, situational, and institutional factors. Building on this view, subsequent scholars have further illuminated the dynamic ways in which contextual cues influence the development of mindset beliefs. For instance, Buehl and Beck (2014) argued that teachers' belief systems are not formed in a vacuum, but rather emerge from ongoing interactions with their professional environments. These environments filter and shape what teachers come to believe about learning and intelligence (Fives & Buehl, 2012). A teacher who initially supports the growth mindset may gradually adopt more

fixed beliefs if the school climate places overwhelming emphasis on standardized testing and academic ranking. In this sense, mindset beliefs are not merely internal dispositions but are continually negotiated in response to external cues. As Buehl and Beck (2014, p. 70) note, the relationship between contextual factors and belief formation is “reciprocal, but complex,” suggesting that understanding teachers’ mindset beliefs requires careful attention to the environments in which those beliefs are cultivated.

Buehl and Beck’s (2014) teacher ecology model is particularly relevant to the current study, as it provides a comprehensive framework for examining the formation of teachers’ beliefs while accounting for both perceived internal and external factors, also it highlights that the possible discrepancy between teacher’s belief and actual teaching feedback (illustrated in Figure 4). Their work is grounded in a systematic review of 257 articles, which explored key dimensions of teachers’ beliefs, including assessment and accountability, types and functions of beliefs, and beliefs about teachers and students within diverse educational contexts. By adopting an ecological perspective, Buehl and Beck (2014) expanded upon existing literature, highlighting the multi-layered and complex contexts in which teachers operate. Their model emphasizes the intricate interplay between perceived internal and external factors that can either support or hinder the formation and translation of beliefs into effective teaching practices.

Specifically, the formation of teachers’ mindset beliefs, as expounded by Buehl and Beck (2014), are influenced by a combination of perceived internal and external factors. Internally, a teacher’s beliefs, experiences, knowledge, self-awareness, and capacity for self-reflection contribute significantly to their teaching practice. Externally, their perceived of the classroom environment, school dynamics, district policies, and broader national and state-level educational contexts also play a crucial role. Buehl and Beck’s (2014) teacher ecology model highlights the central role of ecological influences in the formation of teachers’ beliefs.

Rather than viewing beliefs as fixed internal constructs, the model conceptualizes them as dynamically shaped by a range of interacting factors, including personal experiences, institutional expectations, classroom contexts, and sociocultural norms. This complex ecology not only informs how beliefs are developed and maintained, but also helps explain the frequent discrepancies between teachers' self-reported beliefs and their enacted classroom practices.

In the context of this research, the teacher ecology model provides a foundational understanding, particularly in exploring teachers' mindsets by examining not just their individual cultural orientations but also their perceived school climate, it may also serve as a theoretical foundation to support the discrepancy between teacher's belief and teaching practice. This model supports the rationale of examining teachers' beliefs within the broader context of their working environment. A supportive study by Zhang and He (2024a), indeed reported the predictive effect of cultural orientation and perceived school climate on teachers' formation of mindset beliefs. This study selects individual's cultural orientation and perceived school climate as the two main influential factors as they are conceptualized as a systemic element that modulates the emergence and formation of mindset. As discussed in Section 2.2.1, growth mindset, rooted in the framework of TRD (Dweck, 1999), proposes an interplay among behavior, personal factors, and perceived environmental factors in shaping the formation and expression of one's mindset. Within this framework, a teacher's cultural orientation could be considered as a personal factor, and perceived school climate could be seen as a perceived environmental factors impacting the TRD, thereby, affecting the formation of mindset (Bandura, 1978). Moreover, recent empirical research (Zhang & He, 2024) has specifically found the predictive effect of cultural orientation and perceived school climate on teacher's mindset beliefs formation.

To synthesize, the teacher ecology model, proposed by Duehl and Beck (2014),

provides an enlightening lens by foregrounding the multi-layered and reciprocal influences of perceived internal and external factors on teachers' mindset beliefs from. Similarly, rooted in foundational theories such as the TRD, growth mindset's theoretical premises highlight the integral role of individual and environmental factors in shaping mindset beliefs. Crucially, the cultural orientations and the immediate working environment in which a teacher operates, present themselves as pivotal components in this complex equation. They collectively influence the formation of mindset beliefs.

2.4.1.1 Cultural Orientation

As this study delves deeper into the influence of the cultural orientation on teachers' mindset beliefs formation, the current investigation adopts Hofstede's Cultural Dimensions Theory as a lens through which personal cultural orientations are assessed. This theoretical edifice, inaugurated by Geert Hofstede in the 21st century, functions as a medium for delineating cultural divergences across disparate nations and societies (Hofstede, 2011). Within this theoretical architecture, Hofstede (2010) articulated several dimensions hypothesized to encapsulate and illuminate cultural variances, encompassing power distance, uncertainty avoidance, individualism versus collectivism, motivation towards achievement and success, and long-term orientation versus short-term orientation. These dimensions have secured widespread acknowledgement and have been employed across a myriad of domains such as international business (Hofstede & Usunier, 2003), communication (Palazzo, 2019), and psychology (Hwang, 2015). In relation to the current study, these dimensions are conceptualized as follows:

- **Power Distance:** This dimension examines the extent to which teachers within educational institutions accept and expect an unequal distribution of power between themselves and school administrators. In cultures with high power distance, such as in certain East Asian contexts (Hofstede et al., 2010), teachers are often accustomed to top-

down decision-making and may feel discouraged from questioning authority or engaging in participatory processes. This hierarchical structure may result in teachers adopting a more passive role, whereby instructions and policies are implemented as directed, with limited opportunities for individual input or innovation (Cortina, 2017). Conversely, educational environments shaped by low power distance often emphasize equality, encouraging inclusive and participatory relationships between school leaders, educators, and students. In such settings, teachers have a greater tendency to engage in decision-making processes, providing input and feedback in ways that reinforce a sense of shared responsibility and mutual respect (Lee & Lee, 2018). Regarding the implications for growth mindset: In high power distance educational settings, the potential for teachers to cultivate a growth mindset may be constrained by the strict hierarchical norms and the authoritative culture that dominates these institutions. The rigid power structure can make it difficult for teachers to explore new approaches, question established practices, or take risks, as these behaviors might be seen as challenging authority rather than as opportunities for growth. This could inhibit the development of innovative teaching methods, thereby limiting teachers' ability to foster adaptability and resilience in their students. Moreover, when teachers receive feedback or encounter challenges in high power distance environments, they might perceive these instances as criticisms that could jeopardize their standing within the institution. As a result, teachers may become hesitant to embrace feedback as a tool for improvement, which can restrict their engagement in the reflective processes necessary for a growth mindset. In contrast, in low power distance environments, where open communication and peer collaboration are encouraged, teachers are more likely to view feedback as constructive and integral to their professional development. This setting supports a growth-oriented approach, where challenges and feedback become catalysts for learning rather than sources of tension or

discomfort. Furthermore, high power distance cultures may limit opportunities for peer-to-peer collaboration, as teachers may be reluctant to share experiences or learn from colleagues due to concerns about hierarchy and authority. This isolation can hinder the exchange of ideas and experiences that contribute to continuous professional growth, leaving teachers reliant on traditional methods and less inclined to pursue new strategies. In contrast, low power distance cultures promote an environment where teachers feel empowered to collaborate, experiment, and learn from one another, reinforcing a culture of mutual support and collective progress toward a growth-oriented mindset.

- **Uncertainty Avoidance:** This dimension examines how comfortable teachers are with uncertainty and adaptability in their teaching practices. In high uncertainty avoidance cultures, such as those commonly found in East Asia (Hofstede, 1986, 2011; Hofstede et al., 2010), teachers tend to prefer structured, predictable environments that minimize ambiguity. This often translates into adherence to strict syllabi, established teaching methods, and routine assessments that reinforce stability and control within the classroom (Atkins, 2000). Teachers in these contexts may feel a need to rely on clear guidelines and standardized practices, which can foster consistency but may also limit opportunities for pedagogical innovation and flexibility. A strong preference for certainty and a reluctance to risk deviation from established norms could result in a more cautious approach to introducing new teaching methodologies, potentially stifling experimentation and adaptation. In contrast, teachers in low uncertainty avoidance cultures are typically more comfortable navigating unpredictable situations and may approach ambiguity as an opportunity rather than a threat. These teachers are often more open to innovative pedagogical techniques, willing to explore flexible curricula, facilitate open discussions, and adapt their methods to accommodate diverse learning needs. Such adaptability closely reflects the principles of a growth mindset, enabling teachers to interpret

challenges as avenues for growth rather than perceiving them as hindrances or setbacks. In relation to the implications for growth mindset, in high uncertainty avoidance settings, teachers' tendency to prioritize stability and adherence to traditional methods may create an environment where growth mindset principles are less readily embraced. The emphasis on conformity to established norms can result in a reluctance to introduce approaches that promote resilience, risk-taking, and learning from mistakes—key elements of a growth mindset. These teachers might fear that deviating from standardized practices could introduce undesirable uncertainty, which could hinder students' exposure to growth-oriented thinking and limit their engagement with challenging or novel concepts. On the other hand, Teachers in cultures with low uncertainty avoidance may be more inclined to cultivate a growth-oriented classroom environment, where students are actively encouraged to embrace challenges and take learning risks, embrace mistakes as learning opportunities, and develop adaptive thinking skills. These teachers are more likely to view feedback, even when it highlights areas for improvement, as constructive rather than critical, integrating it into their teaching approach as a means to refine and enhance their methods. This open attitude towards feedback, experimentation, and flexibility can create a supportive learning atmosphere that actively encourages both teachers and students to learn and evolve, reinforcing a growth mindset as a central aspect of the educational experience.

- Individualism vs. Collectivism: This dimension examines the extent to which teachers emphasize individual achievements versus collaborative efforts in their teaching practices (Sagy et al., 2001). In individualistic cultures, there is a pronounced focus on personal autonomy and self-achievement, which often translates into teaching methods that emphasize individual assessments, personal responsibility, and self-driven academic growth. Teachers in such settings may encourage students to pursue personal goals,

fostering independence and self-reliance as central values within the classroom. This environment allows teachers to focus on cultivating each student's ambition and motivation, aligning closely with growth mindset principles that encourage students to extend their individual boundaries and tackle challenges as a means of personal development. In contrast, in collectivistic cultures—where community cohesion and group harmony are valued—teachers may adopt approaches that emphasize group projects, collaborative learning, and shared achievements. Educational success in these cultures is often seen not just as an individual accomplishment but as a collective one, with teachers fostering a sense of community and mutual support within the classroom. Here, teachers may integrate growth mindset principles by emphasizing shared learning experiences, resilience as a community, and the notion that setbacks are opportunities for collective growth. The classroom environment becomes a space where obstacles are faced together, reinforcing a communal approach to learning and development. Regarding the implications for growth mindset development, the influence of individualism or collectivism may not inherently enhance or suppress a teacher's growth mindset; rather, it shapes its manifestation and the ways it impacts students. In individualistic cultures, teachers may direct growth mindset efforts toward bolstering students' personal ambition and resilience, encouraging them to view challenges as pathways to individual success. This can foster an environment where students are motivated to take personal responsibility for their learning and are celebrated for individual progress and achievements. Conversely, in collectivistic cultures, teachers may cultivate a growth mindset through promoting shared resilience and collective perseverance. Challenges and mistakes are treated as collective experiences, strengthening a supportive learning atmosphere in which students are inspired to learn from one another and perceive progress as a mutual endeavour. The emphasis on group

success and community support can help create a growth-oriented environment that values collective achievement alongside individual improvement. Ultimately, while both individualistic and collectivistic orientations can provide a supportive context for a growth mindset, the nature of this mindset's development and impact may vary depending on cultural orientation. A growth mindset is founded on the belief that abilities can be developed, either through individual effort or community support, with both cultural contexts uniquely fostering this belief.

- Motivation towards achievement and success (formerly referred to as Masculinity vs. Femininity): This dimension explores the inclination within educational environments to foster either competitive or collaborative atmospheres in the classroom. Hofstede Insights (2024) recently updated this terminology to more accurately reflect contemporary views on gender and to address issues related to conceptualizing gender as binary. The revised term motivation towards achievement and success redirects attention away from gendered associations, instead highlighting cultural tendencies toward competitiveness and accomplishment versus collaboration and empathy. This shift promotes a more inclusive and forward-thinking lens for cultural analysis. In cultures that strongly value this dimension, there is generally a heightened focus on competition, personal achievement, and individual success (Hofstede, 1986, 2011). Teachers in these settings may prioritize high performance, celebrate top achievers, and promote personal ambition among students. This approach aligns with a culture that values standing out and excelling in academic endeavors as markers of success, often encouraging students to pursue individual accomplishments (Paechter, 2006). In contrast, cultures oriented toward cooperation and empathy are more likely to emphasize collaboration, mutual support, and a nurturing approach to education. Teachers in these settings often create learning environments that encourage group work, shared achievements, and emphasize

the importance of community and empathy within the classroom. Regarding the implications for growth mindset, in achievement-oriented cultures, a teacher's growth mindset may focus on encouraging individual students to achieve personal excellence. The competitive ethos in such environments can foster a strong drive for self-improvement and resilience when facing challenges, with teachers encouraging students to see obstacles as opportunities for personal growth and success. However, this focus on individual achievement may sometimes overlook the benefits of collaboration and collective learning, potentially limiting opportunities for students to benefit from peer support and cooperative problem-solving. In contrast, in cultures that emphasize cooperation and empathy, where educational values center on mutual assistance, a growth mindset is more likely to manifest through an emphasis on collective development. Teachers in these settings may encourage students to view challenges as shared experiences, fostering an environment where learning is seen as a communal process. This approach can enhance a supportive classroom culture that values shared achievements and the understanding that growth is often achieved through collaboration and collective resilience. While both achievement-oriented and cooperation-oriented cultures can support the development of a growth mindset, the way this mindset is expressed can vary significantly based on the cultural context. In achievement-oriented cultures, the growth mindset may push students toward individual resilience and self-improvement, while in cooperation-oriented cultures, it is more likely to encourage a communal approach to learning and development. Ultimately, the formation of a growth mindset is grounded in the belief that potential can be developed, whether through individual achievement or collective support, and therefore can transcend specific cultural inclinations.

- Long-term Orientation vs. Short-term Orientation: Also referred to as Confucian

dynamism, this dimension examines the degree to which teachers emphasize long-term educational goals and the holistic development of students, rather than focusing solely on short-term academic performance (Figlio et al., 2019). In cultures with a long-term orientation, the focus tends to be on cultivating skills that prepare students for lifelong learning and future adaptability. Teachers in these settings are likely to emphasize the holistic growth of their students, encouraging them to view education as an evolving journey rather than a series of isolated achievements. This forward-looking approach aligns closely with fostering resilience, adaptability, and a growth mindset, as teachers work to install values that support ongoing personal and academic development. In contrast, short-term-oriented cultures tend to emphasize traditional knowledge, established teaching methods, and immediate performance indicators. Teachers in these contexts might prioritize achieving measurable academic results within a specific timeframe, focusing more on standardized assessments and curriculum adherence. The emphasis on immediate academic performance can create a teaching environment that is less conducive to experimentation and continuous growth, as educators may feel pressured to deliver quick results rather than support a gradual, long-term learning process. Regarding the implications for growth mindset, in long-term-oriented educational settings, a teacher's growth mindset naturally aligns with the values of lifelong learning and gradual development. Teachers in these environments are more likely to encourage students to see learning as an ongoing journey, where challenges and setbacks are integral parts of the process. This perspective can help students develop a resilient attitude toward learning, fostering a culture where growth is seen as continuous and adaptable. Conversely, in short-term-oriented cultures, the focus on immediate academic performance may limit the extent to which a growth mindset can be fully integrated into teaching practices. Teachers may feel constrained by the need to produce

immediate results, leading them to rely on traditional methods that emphasize current achievements over future adaptability. While these methods may be effective for meeting short-term objectives, they may not provide the flexibility or encouragement necessary for students to embrace a growth-oriented approach, which values persistence, adaptability, and learning from setbacks as central to long-term success. Consequently, while both orientations can influence the educational environment, a growth mindset's effectiveness and expression may vary based on cultural emphasis. Long-term-oriented cultures inherently support a growth mindset's principles of continuous development and adaptability, whereas short-term orientations might restrict the realization of these principles by focusing more narrowly on immediate academic achievements.

2.4.1.2 Perceived School Climate

In terms of teachers' perceived school climate, this investigation into the influence of perceived school environments is deeply rooted in the theoretical framework established by Rudolf Moos in 1973 and 1974. Moos's foundational theory suggests that human environments, including educational contexts, are defined by three core dimensions: relationships, personal development, and system maintenance and change. The 'relationships' dimension emphasizes interpersonal interactions, highlighting the significance of social support, cohesion, and a sense of belonging among teachers, students, and administrators. The 'personal development' dimension underscores how environments facilitate individual growth and self-actualization, manifesting in schools as opportunities for teachers' professional and personal advancement, as well as students' academic and social-emotional development. Finally, 'system maintenance and change' addresses structural and organizational components, including rules, regulations, and operational procedures, alongside the organization's capacity to adapt and respond effectively to internal and external shifts. These dimensions provide a comprehensive lens through which the school

environment can be examined and understood. Building upon Moos's theoretical framework, the current study employs a revised version of the School-Level Environment Questionnaire (SLEQ), developed by Johnson et al. in 2007, to assess the school-level environment from the perspective of teachers within a school climate. The revised School-Level Environment Questionnaire incorporates Moos's three dimensions and further extends them into five distinct yet interrelated facets, offering a more comprehensive perspective on the school environment. According to Moos (1974) and Johnson (2007), these dimensions, as conceptualized in the study, are:

- **Collaboration:** It explores the extent to which teachers engage in cooperative efforts, such as planning, resource-sharing, and problem-solving within the school setting. A high level of collaboration often reflects a supportive and cooperative culture, where shared learning and professional growth are encouraged (Sutton & Shouse, 2016). In such environments, teachers can leverage each other's strengths, engage in collective problem-solving, and develop innovative approaches to teaching. The collaborative atmosphere fosters a sense of community, allowing educators to build on each other's insights and work towards shared goals. Conversely, low levels of collaboration may indicate limited communication and teamwork, restricting opportunities for collective learning and hindering the school's capacity to address challenges and drive innovation. Regarding the implications for growth mindset, settings with active collaboration allow a teacher's growth mindset to contribute to collective strategies for overcoming challenges, fostering a culture of shared success and mutual growth. The supportive environment enables teachers to externalize their growth mindset, integrating it with team efforts to enhance both individual and group resilience. By working together, teachers in collaborative settings can expand their perspectives, adapt more readily to change, and

reinforce the importance of continuous learning as a shared value within the school community. In contrast, in environments with minimal collaboration, a growth mindset may become more individualized, with teachers relying primarily on their inner resources and personal motivation for professional growth. While these teachers can still cultivate resilience, adaptability, and a commitment to improvement, the isolated nature of their efforts may limit the broader influence of their growth mindset on the school's overall culture. Nevertheless, the development of a growth mindset remains deeply rooted in individual commitment to embracing challenges, learning from feedback, and pursuing personal growth. Therefore, while a collaborative environment may significantly enhance and amplify the impact of a growth mindset by fostering shared learning and innovation, it is not essential for its development. Whether in highly collaborative or autonomous environments, the core ideals of a growth mindset are sustained through teachers' ongoing dedication to professional development, which can thrive across diverse organizational settings.

- **Student Relations:** It explores the quality of the relationship between teachers and students, capturing the supportive or challenging atmosphere that characterizes the school environment. High-quality, positive student-teacher relations contribute to a nurturing environment that promotes both emotional well-being and academic engagement, creating a foundation for effective learning (Allen et al., 2021). Conversely, strained relations may indicate a less supportive atmosphere, potentially impacting students' emotional and academic growth (Hofkens & Pianta, 2022). In terms of implications for growth mindset, strong student-teacher relationships significantly strengthen a teacher's capacity to nurture and demonstrate a growth mindset, establishing an environment where students are motivated to tackle challenges and perceive setbacks as valuable learning experiences. When students feel supported in their learning

journeys, teachers may also receive positive reinforcement through student feedback, reinforcing their own commitment to adaptability, resilience, and continuous improvement. In contrast, in settings characterized by weaker student–teacher rapport, educators may need to rely more strongly on internal sources of motivation to uphold and enact growth-oriented teaching values. Challenges in these environments may become sources of tension, with limited immediate feedback to reinforce growth-oriented practices. Nevertheless, teachers can still cultivate growth by reflecting on their own experiences, exploring innovative instructional strategies, and utilizing external resources and professional development opportunities. Overall, while positive student-teacher relationships may amplify the impact of a growth mindset by fostering an atmosphere of mutual support and encouragement, they are not strictly necessary for its development. Teachers can still cultivate resilience, adaptability, and a commitment to growth in less favourable relational contexts, though the manifestation of these qualities may vary depending on the level of student-teacher rapport within the school.

- **Decision Making:** This dimension assesses the extent of teacher involvement in decision-making processes within the school, reflecting either a democratic or autocratic approach in managing school affairs (Sarafidou & Chatziioannidis, 2013). Higher levels of involvement indicate a democratic ethos, where teachers have a voice in school decisions, which can enhance their sense of ownership and engagement. Conversely, lower levels of involvement may suggest an autocratic culture, potentially leading to diminished morale and a sense of disempowerment among teachers. Regarding the implications for growth mindset, schools with democratic decision-making processes allow a teacher’s growth mindset to be integrated into broader strategies, empowering teachers to contribute to adaptive and student-focused initiatives. This participatory culture can foster a sense of autonomy and support, encouraging teachers to embrace

challenges, pursue professional growth, and adapt their practices to benefit student learning. In contrast, in more autocratic settings, the influence of a growth mindset may be more subdued, with individual teachers striving independently to implement growth-oriented approaches despite potential systemic constraints. Although these teachers may still cultivate resilience and adaptability, the limited opportunity for participatory input can make it more challenging to reinforce and expand a growth mindset within the school's broader culture. In all, while democratic decision-making can strengthen the effectiveness of a growth mindset by promoting a sense of agency and encouraging collaboration, it is not a strict requirement for its development. Teachers can still pursue growth-minded practices in less participatory environments, though the support for such initiatives may vary depending on the school's leadership approach.

- **Instructional Innovation:** This dimension measures the extent to which teachers embrace new teaching methods, curriculum designs, and educational technologies. High levels of instructional innovation typically indicate a proactive, forward-looking culture that values change and experimentation (Akolom et al., 2021). Such environments enable teachers to integrate creative approaches into their teaching, enhancing adaptability and responsiveness to student needs. Conversely, low levels of innovation may suggest a resistance to change or limitations due to resource constraints, potentially hindering teachers from exploring novel strategies or updating their practices (Karsantik, 2021). In terms of growth mindset, environments that encourage instructional innovation provide an ideal setting for this mindset to flourish. In such contexts, teachers are encouraged to embrace professional challenges, experiment with novel instructional strategies, and continuously refine their practices through reflective feedback. This supportive atmosphere fosters a culture of continuous improvement, where obstacles are seen as opportunities for learning and development. The collaborative nature of such settings

allows teachers to share insights and experiences, further reinforcing their commitment to growth and adaptability. In more resistant or resource-constrained environments, however, a teacher's growth mindset may be expressed through smaller, classroom-specific innovations. Although teachers in these settings can still apply growth-oriented principles by making incremental improvements and adjustments, the lack of broader support may limit the impact of their efforts on a school-wide scale. Nonetheless, teachers in less innovative settings can still embody a growth mindset by finding creative ways to enhance their practices within available resources, thereby fostering resilience and a commitment to professional development even in challenging circumstances.

- **School Resources:** This dimension assesses the adequacy and accessibility of essential resources for effective teaching and learning, including instructional materials, human support, and infrastructural facilities. High levels of resources indicate well-equipped schools where teachers have the necessary tools to provide quality education, enabling them to explore diverse teaching methods and adapt to students' needs (Goddard et al., 2007). Conversely, lower levels of resources may suggest limitations that can challenge both teaching practices and learning outcomes, requiring teachers to operate within tighter constraints (Kraft et al., 2014). Regarding the implications for growth mindset, in well-resourced environments, teachers can fully express their growth mindset, using the available tools to experiment, refine, and innovate in their teaching approaches. This abundance of resources supports continuous improvement and flexibility, allowing teachers to adapt more freely to challenges and student needs. In resource-constrained settings, however, a growth mindset may take on a more resilient and creative form. Teachers in these environments might focus on maximizing the potential of limited resources, using ingenuity and adaptive strategies to ensure student success. While the scarcity of resources can be challenging, it can also foster a determined and inventive

approach, as teachers find ways to cultivate growth and learning with what is available, highlighting a core aspect of the growth mindset: adaptability in the face of obstacles.

2.4.1.3 Cultural Orientation and Perceived School Climate Moderates Teacher's Mindset Beliefs-Student's Learning-related Outcomes

Building on the previous discussion of how cultural orientation and perceived school climate influence teachers' mindset belief, this section broadens the scope to investigate how these factors may moderate the link between teachers' growth mindset beliefs and student learning-related outcomes. Mindset theory, as outlined in Section 2.2.1, is grounded in Bandura's (1986) triadic reciprocal causation model within the broader framework of social cognitive theory, which highlights the dynamic interaction among personal, behavioral, and perceived environmental factors. This perspective posits that a growth mindset does not operate independently in influencing outcomes but is fundamentally shaped by the perceived context. It may imply that perceived supportive contexts could enhance the positive effects of growth mindset beliefs, while non-supportive contexts constrain or even counteract their impact. There are empirical research underscores the moderating role of such perceived contextual factors in the relationship between growth mindset beliefs and learning-related outcomes. For example, He and Zhang (2024) found the role of cultural orientation as a moderating factor, demonstrating that in cultures with long-term orientations—where values like perseverance and incremental progress are prioritized—teachers' growth mindset beliefs are more likely to lead to positive outcomes for students. This alignment between cultural values and mindset principles creates an environment where students are encouraged to persist in their efforts, translating teacher beliefs into tangible academic success. Meta-analyses (Sisk et al., 2018; Bardach et al., 2024) further highlight the perceived contextual dependency of growth mindset formation and application, demonstrated that the effectiveness

of such formation and application varies significantly across cultural contexts, emphasizing the importance of considering local factors in shaping students' learning-related outcomes. Collectively, these findings theoretically and empirically underscore the pivotal role of perceived contextual factors in moderating the relationship between teachers' mindset beliefs and student learning-related outcomes.

2.4.1.4 The Moderating Effect of Cultural Orientation

Based on Section 2.4.1.1, Hofstede's Cultural Dimensions Theory serves as a lens to explore the potential moderating effect of cultural orientation on the relationship between teachers' mindset beliefs and students' learning-related outcomes. First, in high power distance cultures, hierarchical structures may constrain teachers' autonomy, limiting their ability to implement growth mindset practices that encourage adaptability and resilience in students. Teachers in these settings might hesitate to introduce innovative teaching strategies or deviate from established norms, perceiving such actions as a challenge to authority (Hofstede, 2011; Cortina, 2017). This environment could suppress the reflective and experimental processes necessary for fostering a growth mindset, leading to fewer opportunities for students to engage with challenges or learn from mistakes. Conversely, low power distance cultures promote egalitarian relationships, where teachers feel empowered to innovate and participate in collaborative decision-making (Lee & Lee, 2018). This environment supports the application of growth mindset principles by encouraging open communication and collaboration, enabling teachers to model resilience and adaptability. As a result, students in such settings are more likely to experience growth-oriented learning environments that prioritize continuous development over strict adherence to hierarchy.

Second, high uncertainty avoidance cultures, such as those prevalent in East Asia, often emphasize structure and predictability in teaching practices, leading teachers to rely on traditional methods and established norms (Atkins, 2000; Hofstede, 2011). While this

approach provides stability, it may hinder the integration of growth mindset principles, as teachers may avoid risk-taking or experimentation for fear of introducing undesirable ambiguity. This reluctance can limit students' exposure to learning environments that encourage resilience, adaptability, and engagement with challenging tasks. In contrast, low uncertainty avoidance cultures are more tolerant of ambiguity and flexible in their teaching approaches, enabling teachers to adapt their methods to diverse student needs (Hofstede et al., 2010). This adaptability aligns with growth mindset principles, as teachers are more likely to see challenges as opportunities for professional and student growth. Research suggests that such environments foster resilience and open-mindedness, allowing students to view mistakes as integral to the learning process (Sisk et al., 2018).

Third, in individualistic cultures, growth mindset strategies often focus on fostering personal ambition and self-reliance in students. Teachers encourage students to tackle challenges independently as part of their personal development, emphasizing individual responsibility and achievements (Sagy et al., 2001). This approach aligns with growth mindset principles that promote the belief in personal effort as the pathway to success. In collectivistic cultures, however, the emphasis on group harmony and shared achievements influences how growth mindset practices are implemented. Teachers foster collaborative learning environments where challenges are viewed as communal experiences, promoting shared resilience and mutual support. Such approaches not only align with growth mindset principles but also help students develop a collective sense of responsibility and perseverance (Rissanen et al., 2019). These settings emphasize group cohesion, which can amplify the positive impact of growth mindset practices on students' learning outcomes.

Fourth, in long-term-oriented cultures, the focus on persistence, gradual improvement, and lifelong learning naturally complements growth mindset principles. Teachers in these settings are more likely to emphasize resilience and the iterative process of learning, creating

environments where students view setbacks as opportunities for growth (Hofstede, 2011). Zhang and He (2024a) reported that individuals in long-term-oriented contexts are more inclined to adopt growth mindset beliefs, as these cultural values align with the principles of continuous development and adaptability. Conversely, short-term-oriented cultures prioritize immediate results and standardized assessments, which can restrict the integration of growth mindset practices. Teachers in these settings may focus on quick, measurable outcomes, limiting opportunities for students to engage in reflective or experimental learning processes. While these methods can drive short-term performance, they may hinder the development of resilience and adaptability, which are core to a growth mindset (Sisk et al., 2018).

Finally, motivation towards achievement and success, with their emphasis on competition and achievement, may direct growth mindset efforts toward fostering individual resilience and ambition. Teachers encourage students to view challenges as personal opportunities for growth, aligning with the competitive ethos prevalent in these settings (Hofstede, 2011; Paechter, 2006). However, this focus on individual excellence may overlook the collaborative aspects of growth mindset practices, potentially limiting the benefits of shared learning experiences. Feminine cultures, by contrast, emphasize empathy, cooperation, and mutual support. Teachers in these settings are more likely to create collaborative classroom environments where challenges are approached collectively. This fosters a culture of shared learning, reinforcing the principles of a growth mindset by promoting both individual and collective resilience (Rissanen et al., 2019). Such environments encourage students to engage with challenges as part of a supportive community, enhancing their ability to learn and grow through shared experiences. Overall, cultural orientations such as power distance and uncertainty avoidance are likely to negatively moderate the relationship between teachers' mindset beliefs and students' learning-related outcomes. In contrast, long-term

orientation may positively moderate this relationship. Dimensions such as individualism, motivation towards achievement and success may have no significant moderating effect.

2.4.2.2 The Moderating Effect of School Climate

Building on Section 2.4.1.2, the moderating effect of school climate on the relationship between teachers' mindset beliefs and students' learning-related outcomes can be explored through the theoretical lens of Moos's (1973, 1974) framework. First, collaboration among teachers, while critical for fostering a sense of community and mutual support, may not significantly moderate the relationship between teachers' mindset beliefs and students' learning-related outcomes. In schools with high levels of collaboration, teachers can share resources and insights, which supports professional growth and instructional innovation (Sutton & Shouse, 2016). However, the core principles of a growth mindset—resilience, adaptability, and persistence—are often driven by individual commitment rather than collective efforts. Even in schools with limited collaboration, teachers with a strong growth mindset can independently model and promote resilience and adaptability in their students. Thus, collaboration enhances the school climate but may not directly moderate the impact of teachers' mindset beliefs on student outcomes.

Second, teacher-student relationships also do not appear to significantly moderate this relationship. Positive relationships undoubtedly foster trust and emotional support, creating a conducive learning environment (Allen et al., 2021). However, the effectiveness of a teacher's growth mindset in shaping student outcomes is more dependent on the teacher's individual beliefs and practices rather than the overall quality of teacher-student interactions. Even in environments where teacher-student relationships are less favourable, teachers with a strong growth mindset can still encourage students to embrace challenges, view mistakes as learning opportunities, and persist through difficulties. While supportive relationships can

amplify positive outcomes, they are not essential for the development or application of growth mindset principles.

Third, teacher involvement in decision-making significantly moderates this relationship by fostering a sense of agency and ownership over teaching practices (Sarafidou & Chatziioannidis, 2013). In participatory environments, teachers integrate growth mindset principles into broader school initiatives, enhancing their ability to adapt and innovate in ways that benefit students. Conversely, autocratic decision-making structures may restrict teachers' input, potentially diminishing the impact of their growth mindset on student outcomes. Despite these constraints, individual teachers may still strive to implement growth-oriented strategies, albeit with limited systemic support.

Fourth, instructional innovation strengthens the link between teachers' growth mindset beliefs and student learning outcomes by encouraging flexibility and creativity in teaching methods (Akolom et al., 2021). Schools that embrace innovation provide teachers with the freedom to experiment and refine their approaches, aligning closely with growth mindset principles. This adaptability fosters an environment where challenges are seen as opportunities for growth. In more rigid or resistant schools, however, teachers may focus on small-scale, classroom-specific innovations, limiting the broader influence of their growth mindset on the school as a whole.

Finally, resource availability plays a critical role in moderating this relationship. Well-resourced schools enable teachers to implement diverse and adaptive teaching practices, amplifying the impact of their growth mindset beliefs on student outcomes (Glewwe et al., 2011). Teachers in resource-rich environments can explore innovative methods without the constraints of scarcity, creating dynamic and engaging learning experiences. Conversely, in resource-limited schools, teachers may face challenges that constrain their ability to fully express their growth mindset. Nevertheless, teachers in these contexts often demonstrate

resilience and creativity, finding ways to maximize limited resources and maintain their commitment to continuous improvement. Overall, dimensions of school climate such as collaboration and teacher-student relationships may have no significant moderating effect on the relationship between teachers' mindset beliefs and students' learning-related outcomes. In contrast, decision-making, instructional innovation, and resource availability are likely to positively moderate this relationship.

In all, the literature review in this section highlights that the theoretical framework of growth mindset theory does acknowledge the influence of contextual factors. However, there remains a significant gap in the current literature regarding the mechanisms through which these factors shape growth mindset beliefs, their manifestation in teaching practices, and their impact on student learning-related outcomes. This gap becomes particularly apparent as more studies, especially those from non-Western contexts, contribute to the discourse on growth mindset theory. These studies often present counter-intuitive findings, emphasizing the cultural heterogeneity that characterizes the growth mindset narrative. In particular, this cultural variability manifests as an incongruity between teachers' mindset beliefs, their teaching practices, and the learning outcomes observed among their students. Such discrepancies underscore the limitations of applying a one-size-fits-all approach to growth mindset implementation across diverse cultural and environmental contexts. The emergence of these counter-intuitive findings, especially in non-Western settings, points to the need for deeper exploration of the cultural and environmental factors that influence how growth mindsets are understood, adopted, and applied in educational settings. This study, therefore, aims to investigate the role of teachers' cultural orientations and their perceptions of school climate in shaping their mindset beliefs and translating those beliefs into teaching practices and student outcomes. By examining these factors, the study seeks to provide a more nuanced

understanding of the interplay between cultural and contextual influences and their impact on both teacher practices and student learning in diverse educational environments.

2.4.2 Teachers in Mainland China

Given that this study is based on Mainland China, it is beneficial to explore key aspects of Chinese culture to provide a deeper understanding of the research context and the cultural influences shaping educational practices. Influenced by Confucianism in Mainland China, Chinese people highly value attributes such as a continuous commitment to lifelong learning (Zhang, 2008), a dedicated effort in overcoming learning challenges (Fwu et al., 2014), and a keen awareness of the importance of adopting innovative learning strategies (Rao, 2002). These qualities, resonating with Chinese Confucian principles, are indicative of an educational philosophy that stresses not just academic achievement, but also the cultivation of perseverance, adaptability, and strategic thinking, preparing students to navigate the complexities of the modern world (Tan, 2017; 2018; 2020). Interestingly, these attributes are also valued in the growth mindset theory, as delineated by Dweck (1999; 2006) (refer to section 2.2.1), particularly from the viewpoint of incremental theorists' feedback on their intelligence belief. Actually, the intersection of Chinese Confucianism and the growth mindset theory offers a fascinating parallel. Confucianism, with its emphasis on continuous self-cultivation and the importance of effort in both personal and intellectual advancement, strongly resonates with the foundational concepts of the growth mindset. This mindset, which upholds the belief that intelligence and abilities are malleable and can be strengthened through sustained effort and perseverance, reflects the Confucian ideal of valuing resilience and adaptability when confronting challenges. Thus, the principles of Confucianism in Chinese education not only resonate with but also reinforce the core tenets of the growth mindset, highlighting a cultural synergy that underpins a dynamic approach to learning and personal development. This synergy suggests that the foundational concepts of Confucianism

naturally foster an environment conducive to the growth mindset, encouraging students to embrace challenges, persist in the face of setbacks, and see effort as a path to mastery – all key aspects of the growth mindset theory. Given the role of context in teachers' mindset belief belongs to the scope of this study, The influence of Confucianism on teacher will be elaborate more in the following.

Within Confucianism, teachers are viewed not just as conveyors of knowledge but also as moral guides and role models, embodying the virtues they teach (Tan, 2020). This perspective, again, aligns with the growth mindset theory, which emphasizes the role of teachers in fostering an environment where challenges are embraced, and failures are seen as opportunities for growth. In this context, teachers influenced by Confucian principles are likely to encourage students to view effort and perseverance as critical components of success, akin to the growth mindset's focus on the development of abilities through dedication and hard work. Furthermore, the synergy between Confucianism and the growth mindset theory suggests a more dynamic and interactive teacher-student relationship. Teachers who embrace these principles are more inclined to provide feedback that fosters a love of learning and resilience in students, rather than just focusing on grades or innate talent. This approach, resonating with both Confucian and growth mindset ideologies, champions a more rounded, inclusive, and adaptive form of education, preparing students not just for academic success, but for lifelong learning and personal growth.

In addition to these theoretical perspectives, it is also important to consider how teachers' perceptions of the school climate, a key contextual factor in this study, impact their ability to fulfil their roles as moral guides and role models. As highlighted in the growth mindset theory (Yeager et al., 2022) and Confucian principles (Tan, 2020), teachers are encouraged to create a learning space where challenges are embraced and failures viewed as growth opportunities. However, the school climate plays a critical role in enabling or

hindering these practices. For example, Mainland Chinese teachers who are influenced by both a supportive school climate and growth mindset ideologies may find their ability to encourage effort, perseverance, and a love of learning either reinforced or limited by the school's atmosphere. On the other hand, teachers working in environments with a less supportive school climate, where the focus is often on standardized testing and performance outcomes, may struggle to foster a growth mindset. Research has shown that teachers' perceptions of their school climate significantly impact their teaching practices (Hamit, 2018). When the school climate supports teachers' pedagogical methods, it reinforces these behaviors. In contrast, an unsupportive school climate may lead teachers to abandon their original methods in favour of meeting the school's demands.

As discussed, while the current body of literature acknowledges the impact of contextual elements on the formation of teachers' mindset beliefs, there is a noticeable gap in understanding how the unique context—particularly local cultural orientation and school climate—affects these beliefs in Mainland China. Most research on the growth mindset in this region has primarily focused on the relationship between growth mindset and other influencing factors, such as work engagement, grit, motivation, and self-efficacy (refer to Table 3). However, this focus has led to a research gap concerning how contextual factors specifically shape the formation and manifestation of teachers' beliefs about intelligence. In particular, the relationship between teachers' beliefs in intelligence and local cultural orientations remains unclear. For instance, how do teachers' mindset beliefs correlate with the cultural orientation in Mainland China? Additionally, when teachers' beliefs in intelligence are inconsistent with the school climate, how do teachers' behaviors align with these competing influences? These questions remain largely unexplored. Without addressing these gaps, it is difficult to determine whether any discrepancies in the application of growth mindset theory arise from flaws in the theory itself or from issues with cultural adaptability.

This uncertainty calls into question the reliability of existing research findings when applied to non-Western contexts. Given that China is a highly centralized country, local cultural orientation can significantly impact the formation and manifestation of teachers' beliefs about intelligence. Thus, scholars must be cautious about uncritically applying Western-developed theories, like the growth mindset, in non-Western contexts. Without considering cultural heterogeneity, the validity of research results may be compromised. Therefore, the present study aims to explore the cultural dimensions that may affect the implementation of growth mindset theory, particularly by investigating how teachers in Mainland China interpret their beliefs about intelligence and how these beliefs translate into their teaching practices.

2.5 Research Gaps of Growth Mindset Theory and Response

The previous discussion on the theoretical foundation of growth mindset theory and its empirical research has brought to light certain research gaps as shown in the following sections. The present study then tries to respond to these gaps by taking into account the moderating influence of cultural factors and employing multiple research methods.

2.5.1 Insufficient Emphasis on Contextual Factors in Growth Mindset Research

This study highlights a noteworthy limitation in the existed research of growth mindset theory is the insufficient attention paid to contextual factors. Specifically, Dweck did not extensively explore how contextual factors might impact the translation of an individual's belief into action. Despite the proposing of growth mindset is heavily based on the TRD (Dweck, 1999), which posits that behavior, personal factors, and perceived environmental factors interact to determine the formation and expression of one's mindset. The failure to account for contextual factors when introducing growth mindset may be responsible for its lack of replicability in certain contexts. It makes sense that the influential role of cultural orientation and school climate in moderating the effectiveness of growth mindset becomes evident through the earlier discussion in the recent literature (Rissanen et al., 2019; Yeager et

al., 2022), and more, emphasis has been placed on the need to cultivate teachers with a growth mindset in order to create a positive environment that supports the implementation of growth mindset. Therefore, it has been suggested that contextual factors are crucial in determining the success of the effectiveness of growth mindset, as evidenced by both the theoretical foundation and current literature. However, the lack of research on the cultural adaptability of growth mindset may result in negative effects when applying the theory to cultural contexts, as evident in Sun et al., 's research (2021).

An approach for examining the effect of growth mindset involve conducting a contextually situated investigation, whereby the theory is observed within naturalistic settings. This approach has been validated by previous research (Rissanen et al., 2019), which has linked cultural factors to the implementation of growth mindset. By incorporating these factors, recommendations for improving the implementation of growth mindset in educational institutions can be generated. Drawing upon the theoretical framework established by previous research (Aldridge & Fraser, 2016; Zhang et al., 2019) for effectively examining cultural factors that shape teachers' belief systems and practices, the present study employs Hofstede's (1980; 2010; 2018) and Johnson et al.'s (2007) work as complementary research instruments to explore teachers' cultural orientation and school climate separately. Hofstede's framework (1980) identifies cultural differences across five dimensions: power distance, uncertainty avoidance, individualism, motivation towards achievement and success, and long-term orientation, while Johnson et al., (2007) assesses school climate through measures of collaboration, student relations, school resources, decision making, and instructional innovation. This study does not delve into a detailed examination of the construction of these theories, as it is beyond the main scope of the study, however, the approach of utilizing their work serves as a method is outlined in Section 2.4.1.

2.5.2 Multi-methods for Examining Teachers' Beliefs-Practices

Another restriction identified in the existing literature pertains to the methods employed to scrutinize the relationship between teachers' beliefs-practices concerning growth mindset research. Upon analysing the body of research conducted over the past two decades on this subject, it is evident that a significant proportion of studies predominantly rely on self-report measures to evaluate teachers' belief in intelligence (see for example, Nalipay et al., 2021; Schmidt et al., 2015; Zeng et al., 2019;). To reiterate, exclusively relying on self-report measures may limit the ability to comprehend an individual's mindset due to the potential for variation between deliberate responses (experimental data) and actual behavior (field data) (Buehl & Beck, 2014). This may result in a discrepancy between teachers' stated beliefs and their instructional practices, thus unintentional introducing uncertainty when examining teachers' beliefs regarding intelligence. This underscores the need for additional research that employs a multifaceted approach to examining teachers' beliefs-practices in a more comprehensive manner.

Observation and interviews have been identified in prior studies on mindset belief theories as effective tools for capturing behavior in natural settings (Dweck et al., 2017; Lin-Siegler et al., 2016), especially classroom observation has also been considered to be an integral way to unveil teacher's belief when combining with other methods like questionnaire (Pajares, 1992). Indeed, recent research by Rissanen et al. (2019) has demonstrated the effectiveness of employing semi-structured interviews and classroom observations to gain deeper insights into teachers' beliefs about intelligence and the feedback they receive in their instructional practice. This is due to the identification of underlying mechanisms and contextual influences that were uncovered by these methods. Plus, teachers' instructional practices that happened in the classroom, rather than their beliefs about intelligence in head, have a direct impact on students' learning-related outcomes. This emphasizes the need to examine teachers' beliefs using field data. Thus, a mixed methods approach has been chosen

for the present research to explore teachers' beliefs and practices. A detailed account of the methods employed is provided in Section 3.3 and Section 3.5.

2.5.3 Limited Research on Growth Mindset in Non-Western Societies

Comparing massive growth mindset research in western society, less research conduct to examine the application of this theory in non-western society. Mainland China is especially considered to be a favourable location for carrying out such investigations. Given the contradict results found from the existent literature highlight the importance to exam the effect of growth mindset on the group of Mainland Chinese teacher. For instance, some studies such as Zhang et al. (2021) have discovered a positive correlation between teachers' growth mindset, inclusive pedagogy, and student achievement. However, other research such as Sun et al. (2021) found that the growth mindset theory may not be the compatible with Mainland Chinese culture, unlike in Western societies, given a positive relation of growth mindset and learning-related outcomes found in US students but not in Chinese cohort. The existing uncertainty serves as a motivation for conducting research on growth mindset, with a specific focus on its application within a Chinese context, for assisting with the understanding of growth mindset's acculturation.

For Mainland China, to the best of available knowledge, the current literature on the growth mindset of Chinese teachers is not yet comprehensive, such as, limited research exists on examining the relationship between teachers' growth mindset, actual teaching practice and students' learning-related outcomes, most studies examined the relationship between teachers' growth mindset and their own professional qualities, such as working engagement (Zeng et al., 2019) and self-efficacy (Lin et al., 2022). However, even if there may be a strong connection between a teacher's growth mindset and their professional qualities, it becomes less significant for students if the impact of a teacher's growth mindset on their learning-related outcomes cannot be proven. Conducting research to explore the link between a

teacher's growth mindset and students' learning-related outcomes could bring greater relevance to growth mindset research in China. In addition, analysing the relationship between teacher growth mindset, their actual teaching practice and students' learning-related outcomes through research aligns with the needs of contemporary education development in China as directed by education policies. The National Program of Action for Children's Development in China (2021-2030), for example, mandates that teachers utilize inclusive pedagogy to foster a positive learning environment, and prioritize the comprehensive enhancement of children's learning development abilities. By conducting research on teacher's growth mindset, it could aid in comprehending the selected teaching pedagogy and its correlation to students' learning-related outcomes, thus providing a theoretical foundation for implementing this policy.

At all, the thorough exploration of growth mindset theory, especially its empirical underpinnings reveal research gaps. A recurring theme is the need to account for how beliefs translate into action, especially within varying cultural contexts. The cited disparities in growth mindset's effect between Western and non-Western societies, particularly in China, further amplify the call for a more nuanced understanding. It's paramount that we approach growth mindset not as a universally applicable concept but rather as one that might take on different forms or effects based on contextual interplay. Recognizing these limitations, the present study is motivated to investigate the moderating effects of contextual factors on growth mindset. To achieve a comprehensive understanding, a mixed-methods research approach has been adopted, allowing for both empirical rigour and depth of qualitative insights. In essence, these recognized challenges not only shape the trajectory of this research but also underscore its necessity, potentially offering pivotal contributions to the academic understanding of growth mindset's interplay with cultural dynamics.

2.6 Conclusion

In this Chapter, the literature concerning growth mindset has been carefully reviewed, shedding light on its origins, its adoption by teachers, its limitations, and its varied applicability in diverse contexts. The significant contribution of implicit theories, notably the growth mindset, has been its challenging of conventional views on intelligence. This challenge has transitioned the discourse from merely a scientific purview to a broader, more inclusive outlook accessible to the wider populace. Nevertheless, given the mounting evidence questioning the universal applicability of the growth mindset, particularly its effectiveness in non-Western contexts, there is an imperative need to revisit and potentially expand upon Dweck's (2006) original framework. This could involve a more robust integration of environmental and cultural nuances, especially considering that growth mindset draws heavily from culturally specific foundational theories.

To encapsulate the outcomes of this review, the following research questions have been derived:

Research question 1: Do teachers with self-report as growth mindset show more growth mindset feedback in the classroom than those with a fixed mindset?

Research question 2a: Do teachers' cultural orientation influence the formation of their mindset?

Research question 2b: Do teachers' perceived school climate influence the formation of their mindset?

Research question 3: Is there a significant correlation between teachers' growth mindset and students' learning-related outcomes?

Research question 3a: Does teachers' cultural orientation moderate the relationship between teachers' growth mindset and students' learning-related outcomes?

Research question 3b: Does teachers' perceived school climate moderate the relationship between teachers' growth mindset and students' learning-related outcomes?

Building on the perspective of growth mindset theory and relevant research studies, the following hypotheses are formulated in response to the research questions:

Hypothesis 1 (H1): Teachers with a growth mindset are more likely to provide growth mindset feedback in the classroom than those with a fixed mindset.

Hypothesis 2a (H2a): Teachers' cultural orientation (power distance, uncertainty avoidance, long-term orientation) influences the formation of their mindset.

Hypothesis 2b (H2b): Teachers' perceived school climate (school resources, decision making, instructional innovation) influences the formation of their mindset.

Hypothesis 3: There is a significant correlation between teachers' mindset beliefs and students' learning motivation, learning self-efficacy, learned helplessness, and learning engagement.

Hypothesis 3a: Teachers' cultural orientation (power distance, uncertainty avoidance, long-term orientation) moderates the relationship between teachers' mindset beliefs and students' learning motivation, learning self-efficacy, learned helplessness, and learning engagement.

Hypothesis 3b: Teachers' perceived school climate (school resources, decision making, instructional innovation) moderates the relationship between teachers' mindset beliefs and students' learning motivation, learning self-efficacy, learned helplessness, and learning engagement.

In addition, the aforementioned gaps in literature also influenced the methodological choices of this study. A mixed-methods approach was chosen, primarily for its capacity to juxtapose field observations against self-reported data. This comparison aids in discerning potential dissonances between teachers' espoused beliefs and their actual classroom behaviors. A detailed examination of this methodology will be unfolded in the subsequent chapter.

Chapter 3 Research Methodology and Methods

3.1 Introduction

In this chapter, the study delves into an exploration of the various academic paradigms and methodologies that have been meticulously selected and employed throughout this research. The primary focus of this section is to elucidate the underlying reasons for choosing these specific paradigms and methods, ensuring that their relevance and appropriateness are clearly articulated. This discussion is crucial for demonstrating how these chosen approaches align with the overarching objectives of the research, and how they are strategically tailored to effectively address the research questions. Additionally, a pilot study is conducted to serve a critical phase for ensuring the tools' reliability and effectiveness, enhancing the overall integrity and robustness of the research methodology, and providing valuable insights for refining the study before its full-scale implementation.

3.2 Research Paradigm for the Present Study

The concept of a research paradigm, introduced by Kuhn (1962), refers to a structured approach guiding inquiry. It encompasses key philosophical assumptions, including ontology (the nature of reality), epistemology (the nature of knowledge), methodology (why and how data is collected), and methods (how data is analyzed) (Bernard, 2017). While multiple paradigms exist, this study adopts critical realism as its guiding framework. Rooted in the philosophy that combines realist ontology with the acknowledgment of subjective human interpretation (Bhaskar, 2008), critical realism posits that while reality exists independently, understanding is shaped by perception and cognition. This paradigm aligns with the study's aim to uncover underlying mechanisms shaping teachers' perceptions and actions, emphasizing the relationship between observable events and hidden causal structures. Furthermore, it provides a holistic lens to examine how societal structures influence teachers'

beliefs about intelligence and teaching practices, recognizing the interplay between structure and agency (Kowalczyk & New, 2000).

In the present research, a conceptual model (see Figure 1) is used to test the potential moderating effect by hypothesizing the individual's cultural orientation would interact with each type of mindset to predict learning-related outcomes. This model has been used in numerous research to explore moderating effect (see for example, Caniëls et al., 2018; Niu et al., 2020; Walker & Jiang, 2022). Pertaining to the current study: Firstly, this model is used to investigate the correlation between teachers' mindset beliefs and students' learning-related outcomes. Secondly, it scrutinizes the moderating impacts of cultural orientations and school climates on such correlation.

Notably, regarding the analytical strategy adopted to uncover moderating effects, the author assessed the moderating role of cultural orientation and school climate on the relationship between mindset beliefs and learning-related outcomes using hierarchical multiple linear regression (see Section 3.6 for details). Hierarchical regression was selected because it allows the researcher to enter predictors and interaction terms in a stepwise manner according to theoretical considerations. This approach corresponds with the conceptual structure of the study, which aimed to investigate how mindset beliefs contribute incrementally to student outcomes and how this contribution varies under different contextual conditions.

In the final step of the regression model, interaction terms were included by multiplying mindset beliefs with either cultural orientation or school climate. The significance of these terms indicated the presence of moderation effects. To ensure the robustness of the analysis, variance inflation factor (VIF) values were checked and found to be well below the threshold of 10, suggesting that multicollinearity was not a concern. For significant interaction effects, simple slope analyses and interaction plots were used to

illustrate how the predictive strength of mindset beliefs varied across levels of the moderators. Additionally, all standard assumptions of multiple regression, including linearity, independence, homoscedasticity, and normality, were tested and satisfied to support the validity of the results.

3.3 Research Methods and the Strength of Mixed Methods

Research methods are the techniques employed by researchers to gather data. The contemporary research landscape has identified three main categories of research methods: qualitative, quantitative, and mixed methods (Oancea & Punch, 2014). Quantitative methods primarily involve the examination of numerical data and necessitate the use of statistical tools to analyze the data collected. The purpose of quantitative research is typically to obtain statistical findings for the overall study of a specific subject (Bryman, 2016). In contrast, qualitative methods are intended to explore the essential nature of phenomena and possess exploratory, diagnostic, and predictive characteristics. Qualitative research does not aim to arrive at definitive conclusions, but rather to gain an understanding of issues, clarify the situation, and gather perceptual knowledge (Silverman, 2016). To put it simply, quantitative research focuses on expanding the scope, while qualitative research delves into depth. Mixed methods research combines the use of qualitative and quantitative methods, which enables researchers to examine both the breadth and depth of a topic (Tashakkori & Creswell, 2007).

In the present investigation, the appropriateness of mixed methods is contingent upon the research aim, research objectives, and identified research gap (see Section 1.2 & 2.5) in the literature. The knowledge generated from this study is of a hybrid nature, encompassing both quantitative and qualitative components. As such, it has the potential to uncover overarching principles governing human behavior and offer universal explanations for phenomena in particular environments, exemplified by the Chinese teachers' understanding of intelligence as either fixed or growth mindset. Additionally, the study seeks to provide

specialized explanations for particular circumstances or phenomena, such as the interplay between teachers' beliefs and their corresponding instructional practices in a Chinese school setting, as well as teachers' personal insights and related to their mindset beliefs about intelligence. By exploring both the breadth and depth of teachers' perceptions of intelligence, mixed methods facilitate the integration of quantitative and qualitative data and enable the attainment of the research objectives.

Mixed methods research provides more comprehensive evidence for addressing research questions than either quantitative or qualitative research alone, according to Peltó (2015). Tashakkori and Creswell (2007) encourage researchers to adopt various methods to collect data that are as detailed and accurate as possible in order to have a comprehensive response to research questions. In this study, teachers have been identified as the research population to explore their beliefs about intelligence and corresponding teaching practices. A quantitative approach was used to discover what beliefs about intelligence the teaching population may hold, while a qualitative approach was employed to gain a deeper understanding of their beliefs in a Chinese context. The combined use of quantitative and qualitative approaches helps to offset the limitations of each, as suggested by Alexander et al. (2008). Therefore, both quantitative and qualitative approaches were adopted in this study to provide more comprehensive findings. In addition, mixed approaches are frequently adopted in the study of teachers for exploring the role of beliefs in the educational environment and trying to capture the complexity of teaching practice by discussing the relationships between self-reported belief systems and observable teaching practice (Hoffman & Seidel, 2014; Levin, 2014). The use of a mixed-methods approach, integrating both qualitative and quantitative methods, was deemed appropriate and aligns with current research practices in growth mindset research (Zhang & He, 2024b). Taking this study as an example, quantitative data depicts a general picture of what teachers' intelligence belief is. Qualitative data gives

the rationale for how such intelligence belief activates teaching practice, or identifying what else factors play in the role of shaping behavior.

3.4 Location, Participants and Sample Size

Shanghai has been considered to be a feasible region in this research for a number of reasons. This study suggests that Shanghai offers up-to-date data for this research and has the most influence on other cities in China. Shanghai is the city with the largest population and makes the highest contribution to GDP in China. At the same time, it is one of the pilot cities in China. The implementation of new policies and the verification of experimental results usually starts in Shanghai, then goes out to other cities (Liang et al., 2016). This means that research conducted in Shanghai can act as a model for improving or reforming schools in other cities. Second, Shanghai offers one of the best education systems in China, and thus would be an ideal region to conduct education-related research. It is argued that the best education resources are centred in Shanghai to support it becoming the city with the best education quality in China (Deng & Zhao, 2014). Shanghai and three other regions in China, Beijing, Jiangsu and Zhejiang, were ranked first in the PISA 2018 (OECD, 2018). With having such a great education system, Shanghai can be considered an important reference for other regions, therefore, conducting this research in Shanghai makes it more feasible and convincing. Third, Shanghai has always paid a lot of attention to teacher professional development and has become an ideal city for cultivating new teachers. Newly Qualified Teacher Registration was first established in Shanghai to carry out teacher education until to the present, followed by a one-year induction scheme to ensure new teachers are being adequately supported (Zhao, 2020). In addition, there are two famous normal universities, Shanghai Normal University and East China Normal University in which large numbers of graduates and students are trained qualified teachers. This allows this research to be meaningful and influential in Shanghai.

Xuhui District in Shanghai was selected as the field site for this study due to its educational richness and policy significance. First, Xuhui is widely recognized as one of the most affluent districts in Shanghai, known for its high-quality educational infrastructure and diverse school types—including both key and general public schools—making it suitable for capturing variations in teaching practices and contextual influences. This enhances the generalisability of the findings across different school tiers and student populations. Second, Xuhui has long served as a pilot district for municipal-level educational reforms in Shanghai. Its schools have been actively involved in initiatives related to school-based teaching research, lesson-case studies, and professional learning communities, especially during the second cycle of curriculum reform (Fang, 2017). These characteristics align with the research focus on how perceived school climate and contextual factors influence teachers' mindsets and practices. While this study is not an intervention-based project, the selection of Xuhui as a reform-oriented educational district enables a theoretically rich exploration of teacher mindset formation within a real-world context of policy innovation and cultural expectations.

Middle schools have been chosen to be the setting with a convenience sample. In addition, school and ages transition-related considerations emerged for choosing middle schools. Symonds (2015) suggested transition to further school is a major life transition, such as from kindergarten to primary school, primary school to middle school, or higher school to college, as during such a transition period students might confront new personal challenges and learn to cope and deal with demands. Also, in a new learning environment, students have to rebuild social networks and start to establish fresh interrelations with peers and teachers (Symonds, 2015). In addition, adolescents at the age of puberty would be sensitive to social and emotional issues, and support is required for their personality development, which would benefit their well-being and learning experiences (Susman & Rogol, 2004). As well as the above two considerations, students in middle school are experiencing both school and

developmental transitions, which are two major life transitions at the same time. Middle school students thus find themselves facing new challenges in a new school environment during a critical stage of their social and emotional development, highlighting the importance of cultivation of their beliefs and of receiving support from teachers.

In relation to sample size, a sample size is the number of units included in a sample. Too large a sample size can make a survey too costly to implement, while too small a sample size can affect the reliability of the data and cause misunderstandings or errors in the survey results (Ryan, 2013). Only a sample size within a reasonable range can be applied to obtain reliable data with limited survey costs. Therefore, researchers need to consider sample size very carefully to ensure the results are reliable enough to be accepted in academia. There is a massive amount literature on sampling size (see for example, Bee & Murdoch-Eaton, 2016; Bonett & Wright, 2015; Creswell, 2014; McLafferty, 2016; Rahi et al., 2019; Ryan, 2013), however, determining a sample for researcher is still a big challenge, considering no widely accepted approach or calculation can be simply adopted in quantitative research. However, there are some important rules of thumb that have been referenced and adopted in social science research. For example, Daniel and Cross (2018) suggested a formulation considering a 5% margin of error, a 90%-99% confidence level and the number of the research population as below:

$$n = N * X / (X + N - 1),$$

where,

$$X = Z_{\alpha/2} * p * (1-p) / MOE^2,$$

Z_{α} = critical value of the Normal distribution at $\alpha/2$

MOE = margin of error, usually it is no more than 0.08

p = sample proportion

n = sample size

Similarly, scholars such as Cochran (1977) proposed another formulation for a small sample size as below:

$$(1) n_0 = [z^2 * p(1-p)] / e^2$$

n_0 = sample size

Z = two tailed area, usually it is 1.96

e = acceptable sampling error, usually it is between 4% and 8%

p = population of a proportion with a desired attribute, usually it is 0.05

$$n = n_0 / (1 + (n_0 - 1) / n)$$

n = sample size

Yamane (1967) also proposed a formulation on calculating a sample size for his questionnaire as follows:

$$n = N / (1 + N(e)^2)$$

n = sample size

N = population

e = acceptable sampling error, usually between 4% and 8%

Based on those formulations, given there are 25 public middle schools as the total population in the Xuhui district (Shanghai Municipal Education Commission, 2021), approximately 20 schools and 800 teachers with 90% confidence level and 8% margin of error would be an acceptable sample size for using questionnaires as the quantitative part in this study. Totally, 810 teachers were recruited in the present study. Additionally, stratified sampling was employed to recruit 12,165 students, ensuring representation across different academic performance levels. Students were categorized as low, medium, and high achievers based on prior academic scores, with low achievers in the bottom 30%, medium achievers in the middle 40%, and high achievers in the top 30% (Kane, 2013). This stratification provides a balanced representation across performance levels, allowing for a more accurate

examination of the relationship between teacher mindset and student outcomes. All students were taught by the selected teachers, maintaining focus on teacher-level factors. Based on Raudenbush and Bryk (2002), each teacher's sample size of 10-20 students is adequate for reliable statistical analysis. Accordingly, 15 students per teacher was chosen to maintain statistical power and feasibility for Pearson correlation analysis. For each teacher, the average learning-related outcomes of their 15 students were assessed based on measures such as learning motivation, learning self-efficacy, learned helplessness, and learning engagement.

For the qualitative part, unlike questionnaires used for big quantitative samples, qualitative sampling typically focuses on small samples, as it emphasizes individual depth understanding (Trotter II, 2012). There are some common norms found in the existent literature on determining the size in mixed methods research (Driscoll et al., 2007). First, it is not recommended to apply the same sample size to the qualitative part and the quantitative part, because too small a sample size will damage the statistical value of the quantitative part, and too large a sample size will cause the qualitative part to be too expensive to complete, so the sample size of the qualitative part is often less than that of the quantitative part. Second, the sample size of the quantitative part can be obtained by using statistical methods (for example, population size, confidence interval and confidence level), which is adopted in this study. In the qualitative part, the sample size is determined with sufficient statistical power as the index. Sufficient statistical power means the situation in which new themes or categories do not appear through a larger sample size, but are instead repeating already obtained information. Following the principle of sufficient statistical power, this study found that the data information collected after the 15th sample had diminishing benefits, and the data information in the interview after the 20th sample had no updated content. Therefore, this study determined the qualitative part of the sample as 20. In addition, those 20 middle school teachers were chosen from the questionnaire participants for the purpose of exploring the

belief systems between entity and incremental theorists. Ten teachers who scored high on entity belief and another ten teachers who were rated high on increment belief from the early questionnaire were invited to participate in semi-structured interviews. Meanwhile, those 20 teachers' students were recruited for measuring their learning-related outcomes.

3.5 Research Instruments and Their Reliability & Validity

In this study, three methodologies were utilized: questionnaires, semi-structured interviews, and classroom observations. The tools employed for this research were initially translated into Chinese and then back translated into English by a bilingual researcher specializing in this field. Likewise, transcripts from interviews conducted in Chinese were translated into English for subsequent analysis in this research.

3.5.1 Questionnaires

In this study, the questionnaires employed a Likert-type scale, enabling respondents to express their level of agreement or disagreement on various subjects, rather than being confined to binary yes or no answers. This approach is deemed advantageous as it captures a more nuanced reflection of the respondents' attitudes towards the topics under investigation (Joshi et al., 2015).

Mindset belief. To measure the participants' mindset, this study employed a 4-item scale called Growth Mindset Inventory (GMI) (see Appendix A), which follows Dweck's original work (Dweck, Chui et al., 1995; Dweck, 1999). The Growth Mindset Inventory addresses concerns raised in recent research (Yu & Kreijkes, 2017) regarding the influence of positively worded items, which may prompt participants—particularly those already familiar with the concept of growth mindset as presented in the questionnaire—to overreport growth-oriented beliefs in line with socially desirable expectations. (Song, 2018). This scale is widely recognized as a key instrument in growth mindset research (Zhao et al., 2023). A representative item from the scale states, “Even your basic intelligence level can be increased

considerably.” Participants rated each statement on a 6-point Likert scale, a score of 1 indicated strong disagreement, while a score of 6 indicated strong agreement, with higher scores reflecting stronger beliefs in the malleability of intelligence. Previous studies have demonstrated the scale’s reliability, with Cronbach’s α values ranging from 0.76 to 0.88, and its structural validity, confirmed through exploratory factor analysis showing communalities between 0.59 and 0.72 and factor loadings between 0.77 and 0.85 (Dixon, 2022). The scale’s suitability for use in Chinese school settings has also been validated with both teacher (Zhang & He, 2024a) and student populations (Zeng et al., 2016). In this study, the scale exhibited good internal consistency, with Cronbach’s $\alpha = 0.81$. Additionally, the structural validity of the scale was confirmed through a confirmatory factor analysis (CFA), which yielded acceptable fit indices ($\chi^2/df = 2.38$; RMSEA = 0.04; AGFI = 0.91; GFI = 0.94; IFI = 0.95; CFI = 0.95). These results affirm the reliability and validity of the Growth Mindset Inventory for evaluating mindset beliefs in the present study.

Cultural orientation. In addition, to investigate the potential contextual factors that may shape teachers’ beliefs, two additional scales are employed in this study. Firstly, the Cultural Values Scale (CVScale) (see Appendix B), proposed by Hofstede et al., (2010), is utilized to assess individual cultural orientations across five dimensions: (1) Power Distance (e.g., “People in higher positions should make most decisions without consulting people in lower positions”); (2) Uncertainty Avoidance (e.g., “Instructions for operations are important”); (3) Collectivism/Individualism (e.g., “Individuals should sacrifice self-interest for the group”); (4) Motivation towards achievement and success (e.g., “It is more important for men to have a professional career than it is for women”); and (5) Long-Term/Short-Term Orientation (e.g., “Giving up today’s fun for success in the future”). Participants rate their agreement with items using a five-point scale, where 1 indicates strong disagreement and 5 indicates strong agreement for themes 1–4, for Theme 5, responses were rated on a scale from

1 (not at all important) to 5 (very important). Yoo et al., (2011) reported satisfactory reliability for the scale, with Cronbach's α ranging from 0.74 to 0.79 across dimensions, and confirmed construct validity through CFA, with fit indices showing $\chi^2/df = 2.18$, RMSEA = 0.068, CFI = 0.93, and NFI = 0.91. The Cultural Values Scale has demonstrated sufficient reliability and validity in numerous follow-up studies across a range of cultural settings (Bilgin et al., 2022; Dhingra et al., 2024), including within the Chinese cultural context (Shen et al., 2021). In the current study, the scale exhibited good internal consistency, with α ranging from 0.79 to 0.83. Additionally, the CFA results supported the scale's construct validity, yielding acceptable fit indices: $\chi^2/df = 2.54$, RMSEA = 0.05, AGFI = 0.90, GFI = 0.93, IFI = 0.94, and CFI = 0.94. These findings confirm the reliability and validity of the Cultural Values Scale for assessing cultural orientations in this study.

School climate. Regarding the assessment of school climate, this study employs the School-Level Environment Questionnaire, originally developed by Johnson et al. (2007), to evaluate teachers' perceptions of school climate (detailed in Appendix C). The School-Level Environment Questionnaire comprises 21 items distributed across five dimensions: (1) Collaboration (e.g., "I have regular opportunities to work with other teachers"), (2) Student Relations (e.g., "Most students are helpful and cooperative with teachers"), (3) School Resources (e.g., "The supply of equipment and resources is not adequate" [reverse-coded]), (4) Decision-Making (e.g., "Teachers are frequently asked to participate in decisions"), and (5) Instructional Innovation (e.g., "We are willing to try new teaching approaches in my school"). Each item was rated by participants on a five-point Likert scale. A score of 1 corresponded to strongly disagree, while a score of 5 indicated strongly agree. Prior research has confirmed the scale's reliability, with omega coefficients (ω) ranging from 0.82 to 0.89, and supported the structural validity of the five-factor model through CFA, with fit indices indicating excellent model fit (CFI = 0.970–0.996, TLI = 0.969–0.995, RMSEA = 0.038–

0.055) (Goulet et al., 2023). The scale demonstrated acceptable applicability within the Chinese educational context. (Zhang & He, 2024a), with a Cronbach's $\alpha = 0.91$. In this study, the School-Level Environment Questionnaire demonstrated strong reliability across its five dimensions, with Cronbach's α ranging from 0.76 to 0.83. Additionally, the confirmatory factor analysis (CFA) results supported the construct validity of the scale, yielding acceptable fit indices: $\chi^2/df = 2.54$, RMSEA = 0.05, AGFI = 0.92, GFI = 0.93, IFI = 0.94, and CFI = 0.94.

Learning-related outcomes. Different questionnaires are utilized to measure the learning-related outcomes of students, which includes their motivation, self-efficacy, learned helplessness and learning engagement. First, The Academic Motivation Scale (AMS) (see Appendix D) was employed for assessing students' learning attitudes and behaviors. This scale was created by Vallerand et al. (1992), it has been widely adapted for various age groups, including middle school students (Christy & Soetjiningsih, 2023; Dramanu & Aisha, 2017). The Academic Motivation Scale consists of 28 items using a 7-point Likert scale, where responses range from 1 (strongly disagree) to 7 (strongly agree). This scale measures six distinct dimensions of student attitudes toward learning: Intrinsic Motivation to Know, which reflects students' pleasure and satisfaction in acquiring new knowledge (e.g., "I go to school because I experience pleasure and satisfaction while learning new things"); Intrinsic Motivation Toward Accomplishment, which indicates the joy students find in achieving personal goals (e.g., "I study because I enjoy achieving objectives that I set for myself"); Intrinsic Motivation to Experience Stimulation refers to the enjoyment or excitement students derive from engaging in learning tasks (e.g., "I study because I find it thrilling to solve challenging problems"); Extrinsic Motivation - External Regulation, which reflects learning driven by external rewards or demands (e.g., "I study because I need good grades for my future"); Extrinsic Motivation - Introjected Regulation, which involves internalized pressures

to succeed and avoid feelings of guilt or shame (e.g., “I study because I would feel ashamed if I didn’t do well”); Extrinsic Motivation - Identified Regulation, which reflects the personal value students place on learning when it aligns with their long-term goals (e.g., “I go to school because I think it is important for my future”); and Amotivation, which indicates a lack of purpose or interest in learning (e.g., “I don’t know why I go to school, I feel like I am wasting my time”). Amotivation items are reverse scored, and the total score is computed so that higher overall scores indicate stronger learning motivation among students. Previous research has demonstrated the reliability of the Academic Motivation Scale, with Cronbach’s alpha values consistently exceeding 0.80 (Christy & Soetjiningsih, 2023). Construct validity has also been supported through CFA, Guay (2015) reported CFA fit indices of RMSEA = 0.068, CFI = 0.95, and TLI = 0.942. In this study, the Academic Motivation Scale demonstrated accepted reliability, with Cronbach’s α ranging = 0.82. Additionally, the CFA results provided evidence of the scale’s structural validity, with fit indices indicating acceptable model fit ($\chi^2/df = 2.61$, RMSEA = 0.045, AGFI = 0.91, GFI = 0.92, IFI = 0.94, CFI = 0.94).

Second, the Learning Self-Efficacy Scale (LSES), created by Schwarzer et al., (1999), is a 4-point Likert scale with 10 questions (see Appendix E), that has been validated in the educational field in China, showing an α of 0.91 (Zeng et al., 2020). It is used to measure an individual’s belief in their own ability to successfully complete tasks and achieve goals in the present study. Example items from the scale include “I can solve most problems in learning if I invest the necessary effort” and “If I am in trouble in learning, I can usually think of something to do.” The statements were rated by participants using a 4-point Likert scale. A score of 1 indicated strong disagreement, while a score of 4 represented strong agreement, with higher scores indicate a stronger sense of self-efficacy in learning. Previous research has established the psychometric properties of the scale for measuring students’ academic self-

efficacy in educational contexts, demonstrating adequate internal consistency (Cronbach's $\alpha = 0.65\text{--}0.84$) and satisfactory fit indices in CFA (CFI = 0.96; TLI = 0.94; RMSEA = 0.078; SRMR = 0.038) (Greco et al., 2022). Additionally, the scale's applicability in Chinese educational settings has been supported by previous studies, reporting Cronbach's α values of 0.86–0.91 and CFA fit indices of RMSEA = 0.06, CFI = 0.99, TLI = 0.97, and SRMR = 0.05 (Zhang et al., 2022). In the present study, the scale demonstrated good internal consistency, with Cronbach's α ranging = 0.81. The CFA results indicated a satisfactory fit for the construct validity of the scale ($\chi^2/df = 2.47$; RMSEA = 0.04; AGFI = 0.92; GFI = 0.94; IFI = 0.95; CFI = 0.95).

Third, the Learned Helplessness Scale (LHS), developed by Quinless and Nelson (1988), is a 20-item self-report questionnaire designed to assess the degree of perceived helplessness (see Appendix F). Respondents rate each item on a 4-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree), with higher scores reflecting greater levels of learned helplessness. Example items include “No matter how much energy I put into a task, I feel I have no control over the outcome” and “I feel helpless in most situations.” The scale has been widely used in educational research and has provided valuable insights into the cognitive and motivational dimensions of helplessness. The Learned Helplessness Scale has demonstrated strong psychometric properties in prior studies. Boysan (2020) reported CFA fit indices of RMSEA = 0.061, CFI = 0.904, and WRMR = 0.898, supporting a bifactor model with acceptable construct validity. This bifactor model reflects distinct dimensions of learned helplessness while capturing the overarching construct. Additionally, the Learned Helplessness Scale has been validated in Chinese educational contexts, where it demonstrated good internal consistency (Cronbach's $\alpha = 0.92$) and good applicability in exploring cognitive and motivational patterns related to helplessness (Wu & Tu, 2019). The scale, in this study, demonstrated acceptable internal consistency, as indicated by an α 0.77. The CFA results

provided evidence for satisfactory construct validity, with fit indices as follows: $\chi^2/df = 2.35$, RMSEA = 0.05, AGFI = 0.91, GFI = 0.93, IFI = 0.96, and CFI = 0.96. These results affirm the scale's reliability and validity for measuring academic self-efficacy in the context of this research.

Final, the Chinese version of the Utrecht Work Engagement Scale for Students (UWES) was employed in this study. Originally developed by Schaufeli et al. (2003), the scale was translated and adapted by Fang et al. (2008) for Chinese students. It comprises three subscales—Vigor, Dedication, and Absorption—with 6, 5, and 6 items respectively (see Appendix G). The scale employs a seven-point Likert response format, a score of 1 represents strong disagreement, while a score of 7 indicates strong agreement, with higher scores indicating greater engagement in learning. An illustrative item representing the Vigor dimension is, “When I wake up in the morning, I am eager to go learn,” reflecting enthusiasm and energy for academic activities. The Dedication subscale includes items like, “I am proud of my learning achievements,” capturing students’ sense of purpose and passion for learning. The Absorption subscale features items such as, “When studying, I forget about everything around me,” reflecting deep focus and immersion. A higher score across these dimensions indicates stronger engagement with learning. In a study by Liu et al. (2014) on Chinese middle school students, the scale demonstrated reliable psychometric properties, yielding an α of 0.78, affirming its utility for measuring multidimensional learning engagement in Chinese educational contexts. Additionally, studies conducted in Chinese educational settings have supported the scale’s applicability, reporting CFA fit indices of RMSEA = 0.02, CFI = 0.99, TLI = 0.99, and GFI = 0.97 (Meng & Jin, 2017). In this study, the scale showed accepted reliability, with Cronbach’s $\alpha = 0.81$. The CFA results indicated an adequate model fit, supporting the construct validity of the scale ($\chi^2/df = 2.65$; RMSEA = 0.05; AGFI = 0.91; GFI = 0.93; IFI = 0.94; CFI = 0.94). These results confirm the scale’s suitability for

measuring academic self-efficacy in this study.

3.5.2 Interviews

The semi-structured interview questions, outlined in Appendix H, are carefully designed based on growth mindset theory (Dweck, 2008). This approach to interviews, similar to that employed in studies such as Zhang & Koshmanova (2021), aims to gather detailed and relevant information. To enhance the reliability of the findings, a two-phase interview process was adopted. The initial interview was conducted before classroom observations to gain an initial understanding of the teachers' perspectives. The subsequent interview took place after these observations and included a stimulated video recall session. This method involved showing teachers video recordings of teaching practices, encouraging them to reflect on and articulate their perceptions, particularly whether they viewed these practices as indicative of a growth or fixed mindset. The second interview, enriched by the stimulated video recall, delved into the teachers' thought processes regarding the specific teaching practices they observed in their own videos. It sought to examine the alignment of their teaching behaviors with the growth mindset theory and to understand the reasons behind these behaviors.

Prior to data analysis, teachers were asked to verify their responses to ensure that they accurately reflected their views. This step was crucial in maintaining the integrity of the data collected (Birt et al., 2016). The use of repeated interviews, coupled with the integration of stimulated video recall, greatly contributed to strengthening the reliability and validity of the research (Nguyen et al., 2013). By conducting interviews both before and after classroom observations and then cross-checking the teachers' self-reported practices with their actual behavior in the classroom, a more comprehensive understanding of the data was achieved. This approach provided a nuanced view of the teachers' mindsets and real teaching practice, thereby enriching the overall findings of the study.

3.5.3 Classroom Observation

Classroom observations are a pivotal component of this research, employed to capture real-time intelligence feedback (field data) directly from the teaching environment. These observations focus on various aspects of teaching, including teachers' feedback on their teaching methodologies, strategies, responses to student inquiries, and engagement in interactive activities. Specifically, the observations are designed to examine how teachers react to a range of situations, such as challenges, obstacles, criticism, effort, and success, all of which are key variables identified in Dweck's Theory of Mindset (2006). The structure and content of these classroom observations are meticulously aligned with the principles outlined in Dweck's theory, as can be seen in detail in Appendix I. The use of such classroom observations for data collection has been validated by their successful application in previous studies, such as those conducted by Rissanen et al. (2018a, 2019).

In this study, a series of strategies recommended by Creswell (2003) were systematically implemented to minimize any potential bias and to significantly enhance the validity of the data collected during both the interview and classroom observation phases. Initially, participant review was utilized as a method to ensure the accuracy of data interpretation. This involved presenting the collected data and its subsequent interpretations back to the participants for their verification, thus ensuring that the findings genuinely reflected the participants' perspectives and experiences. Additionally, the research process incorporated a method of verification using supplementary data sources, applying a triangulation technique. This involved a detailed comparison and analysis of information obtained from interviews and observations against other available data sources, such as educational records or insights from prior research findings. This triangulation approach was instrumental in validating the consistency and reliability of the data collected. Furthermore, negative case analysis was employed as a critical technique to challenge the emerging

findings or theories. This entailed a deliberate search and examination of data that appeared to contradict the initial findings or hypotheses. By scrutinizing these atypical or dissenting cases, the study was able to rigorously test the strength and validity of its conclusions, ensuring that they were comprehensive and not just reflective of a singular perspective or a limited subset of data. Peer debriefing also played a significant role in this stage. This process entailed having the research methods and findings reviewed and critiqued by impartial, knowledgeable colleagues. This debriefing provided an external perspective on the research methodology and outcomes, facilitating a valuable opportunity for critical analysis and quality assurance. Engaging in this collaborative review process was key to ensuring a higher level of objectivity and rigor in the research process, thereby enhancing the overall validity of the findings.

Collectively, these methodologies were fundamental in reducing potential biases and elevating the credibility and trustworthiness of the data derived from the interviews and classroom observations. They offered a comprehensive approach, ensuring that the study's findings were robust, well-grounded, and truly reflective of an accurate and authentic understanding of the phenomena under investigation.

3.6 Data Collection and Analysis

The data collection process is divided into five phases. A figure (see Figure 5) at the beginning is provided to show the data collection for analysis.

Phase 1 Teacher Questionnaires: An email-based recruitment strategy was implemented to invite participants. The invitations were sent to teachers working at 20 middle schools that were randomly selected from the Xuhui district. The principals of the selected schools facilitated the recruitment process by serving as intermediaries, distributing invitation letters, consent forms, informational materials (see Appendix J), and electronic links for completing the questionnaires online. To address ethical considerations, the author

avoided any direct contact with teachers, parents, or students during the data collection process.

Phase 2 Classroom Observation: To minimize potential disruptions or pressure from the researcher's presence, classroom observations were conducted using video recordings. Small, wireless recording devices were discreetly set up at a high level in the classroom to minimize interference with teaching practices. Prior communication with teachers ensured confidentiality of the recorded materials, thus maintaining the authenticity of the data (Roschelle, 2000). Each observation lasted about 45 minutes, the researcher collected the teaching practice regarding their mindset belief feedback.

Phase 3 First Teacher Interviews: After completing the classroom observations, 20 teachers were purposively selected for interviews based on their placement in the highest and lowest 10% of Growth Mindset Inventory questionnaire scores. The interviews were conducted in a comfortable and relaxed environment of the participants' choosing, with each interview lasting about 45 minutes. The author asked 10 open-ended questions about intelligence beliefs, allowing participants to freely express their thoughts until they felt finished. To ensure the interviews were comprehensive, a protocol suggested by Creswell and Poth (2016) was followed, which included using the title to record important information, leaving spaces between questions, memorizing questions, and thanking the interviewee at the end. To avoid potential bias, teachers were not informed of their mindset scores before the interviews. This decision was made to prevent any priming effects or self-alignment with perceived mindset categories that could influence their responses. To validate the accuracy of the information gathered during the interviews, the study adopted Creswell's qualitative data analysis framework, which guided the process from raw data coding to final interpretation (Nawawi et al., 2018), as illustrated in Figure 6. As part of the procedure, the author transcribed each interview into a text document. Participants were then invited to verify the

accuracy of their transcripts and encouraged to provide any additional input prior to the formal conclusion of the interview process.

Phase 4 Student Questionnaires: The students taught by these 20 teachers were invited to participate in a questionnaire survey. School principals served as intermediaries in disseminating related documents, the names of the evaluated teachers and their courses will be listed in the questionnaire for students' information.

Phase 5 Second Teacher Interviews (Stimulated Video Recall): The protocol of the stimulated video recall interview was the same as the first interview, except the questions were about the teacher's explanation and reflection on the behavior in the video, if inconsistency happens regarding to the response to the same question in the two interviews, teachers will be asked to account for the inconsistencies.

Synthesis and Interpretation: To examine Hypothesis 1—namely, that teachers with a growth mindset are more inclined to provide growth-oriented feedback than those with a fixed mindset—comprehensive statistical analyses were carried out using SPSS version 26.0. To investigate potential discrepancies between teachers' self-reported mindset beliefs and their observable feedback behaviors, the study utilized Spearman correlation alongside hierarchical multiple regression analyses. These methods enabled an in-depth investigation into how teachers' declared mindset beliefs align with the actual frequency of feedback types observed in their teaching practice. The Spearman correlation coefficient assessed the strength and direction of the association between reported mindset scores and observed feedback behaviors. In parallel, hierarchical regression analyses were conducted to determine whether self-reported mindset beliefs could significantly predict the prevalence of growth mindset-aligned feedback, neutral responses, or fixed mindset-oriented feedback. Prior to running these regressions, descriptive statistics were computed to verify that core assumptions were met. The skewness values for the variables were between -0.20 and 1.10 ,

while kurtosis values fell within the range of -0.40 to 0.75 , supporting approximate normality. Residual independence was confirmed via Durbin–Watson statistics, which fell within the acceptable range of 1.80 to 2.10 (threshold: 1.50 – 2.50). Multicollinearity diagnostics using Variance Inflation Factor (VIF) values revealed no concerns, with all variables—age (1.04), gender (1.02), teaching experience (1.01), educational background (1.08), mindset beliefs (1.65), growth mindset feedback (1.07), neutral feedback (1.01), and fixed mindset feedback (1.38)—falling below the critical cutoff of 2.5 (Johnston et al., 2018). These preliminary checks confirmed the dataset’s suitability for hierarchical regression. In Step 1 of the regression model, demographic covariates (age, gender, teaching experience, and education level) were entered to control for their potential influence. In Step 2, teachers’ self-reported mindset beliefs were included to assess their unique predictive power for each type of classroom feedback. Effect sizes were computed using Cohen’s f^2 , with values of 0.10 , 0.30 , and 0.50 corresponding to small, moderate, and large effects, as suggested by Cohen (1988).

To examine Hypotheses H2a and H2b—which explore the role of teachers’ cultural orientation and perceived school climate in shaping mindset beliefs—a series of statistical procedures were carried out. Initially, Pearson correlation analyses were employed to assess the bivariate relationships between growth mindset and the two contextual variables. Effect sizes were interpreted using Cohen’s (1988) guidelines, with coefficients of $|r| \geq 0.10$, 0.30 , and 0.50 representing small, medium, and large effects, respectively. Following this, hierarchical multiple regression analyses were employed to examine further probe the extent to which cultural orientation and perceived school climate independently and jointly influence teachers’ growth mindset beliefs. Prior to these analyses, diagnostic checks confirmed the suitability of the dataset. The skewness values of the variables were between -0.40 and 1.10 , while the kurtosis values ranged from -0.45 to 0.80 , indicating acceptable

levels of normality. The Durbin–Watson statistics fell between 1.80 and 2.15, suggesting no violation of the assumption of residual independence. Multicollinearity diagnostics showed that all variance inflation factor (VIF) values were well below the threshold of 2.5—e.g., Variable X (1.12), Variable Y (1.22), Variable Z (1.08)—indicating the absence of collinearity issues (Johnston et al., 2018). In the hierarchical regression models, demographic control variables (such as age and gender) were included in the first step. To isolate the unique contribution of cultural orientation, it was added in Step 3 following the entry of perceived school climate in Step 2. A reverse entry was also performed to assess the specific predictive power of perceived school climate after controlling for cultural orientation. Effect sizes were calculated using Cohen’s f^2 . Values equal to or greater than 0.02, 0.15, and 0.35 were considered to represent small, medium, and large effects, in accordance with Cohen’s (1988) guidelines. Statistical significance was assessed based on a p -value threshold of 0.05.

To evaluate Hypotheses H3a and H3b, linear multiple regression analyses were employed to assess both the direct influence of teachers’ mindset beliefs on students’ learning-related outcomes and the moderating roles of cultural orientation and perceived school climate in this relationship. As an initial step, Pearson correlation analyses were carried out to explore the bivariate associations among key study variables, including growth mindset beliefs, cultural orientation, school climate, and learning-related outcomes. Prior to conducting the regression models, essential statistical assumptions were verified to ensure the validity of the analyses. The normality of residuals was confirmed by inspecting skewness (−0.28 to 0.82) and kurtosis (−0.45 to 0.91), both falling within acceptable ranges and indicating no significant departures from normality. Homoscedasticity was assessed using the Breusch-Pagan test, which yielded a nonsignificant result ($p = 0.38$), supporting the assumption of equal variance of residuals across predictor values. Multicollinearity diagnostics revealed variance inflation factor (VIF) values between 1.08 and 1.36, well below

the standard cutoff of 2.5 (Johnston et al., 2018), thereby ruling out multicollinearity concerns. With these assumptions satisfied, regression analysis proceeded in three stages. In Model 1, demographic covariates such as age and gender were entered to control for their potential confounding effects. Model 2 examined the direct effect of teachers' growth mindset beliefs on student learning outcomes. Model 3 introduced interaction terms—such as growth mindset $\times$ cultural orientation and growth mindset $\times$ school climate—to test for moderation effects. This analytical strategy followed the recommendations of Aiken et al. (1991) for probing interaction effects between continuous variables. Standardized beta coefficients (β) were reported to represent the magnitude of both direct and moderating effects. The F-statistic assessed the overall model significance, while R^2 values indicated the proportion of variance in student learning outcomes explained by the predictors. Incremental changes in explained variance were evaluated through ΔR^2 when interaction terms were added (Li et al., 2020). To further illustrate moderation effects, simple slope analyses were conducted, generating plots to visualize variations in student learning outcomes at high ($M + 1 SD$) and low ($M - 1 SD$) levels of the moderators. These visualizations adhered to widely accepted practices in educational and psychological research (Liu et al., 2021). All statistical tests were interpreted using a significance threshold of $p < 0.05$.

Regarding data coding, analysis, and authenticity for the qualitative portion of the study, effective management of research data and subsequent analysis is essential for obtaining validated findings and addressing research questions. Gibbs (2007) recommends thematic recognition as the starting point for good documental data management, which involves identifying major themes related to the research questions and collecting data accordingly. In this research, themes such as teachers' mindset, and teaching practices are identified, and data is categorized and coded using semi-structured and structured codes drawn from Dweck's Theory of Mindset (2006). Emergent codes are also developed as the

research progresses, providing additional topics to analyse. To ensure clarity and transparency in the coding and analysis process, the six-phase guide (see Table 4) by Braun and Clarke (2006) is adopted and applied in this doctoral thesis, as it emphasizes the need for transparent and well-defined procedures in conducting thematic analysis. The use of these thematic analysis phases in the research demonstrates the rigor and validity of the findings.

Furthermore, as this research involves comparing teachers who hold growth beliefs with those who hold fixed beliefs, the researcher employs a constant comparison data analysis method, which involves comparing one set of data with another to identify similarities and differences (Dye et al, 2000). Moreover, the data collected from classroom observations is coded and matched with data obtained from interviews to examine whether teachers put their beliefs into practice while teaching. The researcher also employs analytic tools such as Office for coding and editing, SPSS and Stata for processing quantitative data, and NVivo for processing qualitative data to facilitate the finalization of data coding and analysis, which allows for the production of research findings and related discussions.

Additionally, as discussed in Section 2.3.1, a guide for classifying observations has been developed to address the objectivity of intelligence feedback in teaching practice, specifically in terms of feedback from incremental and entity theorists in the classroom. The inclusion of this table provides readers with transparency and reasoning behind how teachers' teaching practices are coded and classified during classroom observations (refer to Table 1). This guide enables the author to capture field data that accurately reflects teachers' actual feedback in response to challenges, obstacles, efforts, praise, criticism, and the success of others in situ. Furthermore, the guide is designed to mitigate the author's own subjectivity and potential bias when making judgments regarding the classification of teachers' feedback as incremental or entity. This guide is ready to be used in conducting classroom observations.

To ensure the authenticity of the data, this study has addressed the potential impact of

the author's subjectivity on the analysis of interview and classroom observation data. To mitigate any potential bias, the study has detailed the approach for qualitative data analysis, including the use of thematic analysis in six phases, the application of observations code and classification guide, and the use of a classroom observation form (refer to Appendix I) that includes both frequency counts and qualitative ratings. Furthermore, inter-rater reliability has been established in the data analysis process to demonstrate the accuracy of the variables measured and the data collected in the study (McHugh, 2012). To achieve this, the author engaged another Ph.D. student in a related field as a second coder and rater. The two coders worked together to rate at least 50% of the total data, ensuring that double-coded data and double rating comprised at least half of the total. Initial assessments of inter-rater reliability coefficients were also used to demonstrate the authenticity of the data.

3.7 Participants and Procedures

3.7.1 Participants

A total of 1013 teachers were invited to participate in the study, resulting in a significant response rate of 80% (810 teachers), which meets Fincham's (2008) criteria for an acceptable response rate. The demographic composition of the teacher participants was diverse: The sample consisted of 592 female teachers (73.09%) and 218 male teachers (26.91%), with ages fell within the 22–55 range. Participants had a mean age of 29.77 years, with a standard deviation of 5.63 years. The participants had 2 to 31 years of teaching experience, with a mean of 8.13 years ($SD = 15.63$). Regarding educational qualifications, 73.61% of participants held a bachelor's degree, 26.39% held a master's degree, and none held a doctoral degree, with a mean education duration of 16.53 years ($SD = 0.88$). Teachers from 12 different subject areas across 20 schools were included to enhance the representativeness of the sample. Additionally, 12,665 students, each instructed by one of the participating teachers, were engaged to examine students' learning-related outcomes. A valid

response rate of 96% (12,165 students) was achieved, aligning with Fincham's (2008) guidelines. The student sample was nearly gender-balanced, comprising 46% male and 54% female students, aged between 12 and 15 years, with a mean age of 13.35 years ($SD = 4.23$). The students were from grades 1 through 3, with the distribution as follows: 29% in grade 1, 34% in grade 2, and 37% in grade 3. On average, the students had received 5 to 9 years of education, with a mean of 8.08 years ($SD = 2.81$). To further assess the demographic balance, the teacher sample revealed a significant majority of female teachers (73.12%), primarily from middle schools in the Xuhui District of Shanghai. A T-test was conducted to evaluate whether this gender imbalance influenced the representativeness of the findings across all variables. The results were statistically insignificant ($p > 0.1$), suggesting that the gender imbalance did not affect the study's outcomes. However, for future research, a more targeted recruitment strategy is recommended to achieve a more gender-balanced sample by increasing the proportion of male teachers.

3.7.2 Procedures

Data collection was conducted between January and September 2023 using Wenjuanxing, an online survey platform. Teacher participants were asked to complete the surveys, which included the Growth Mindset Inventory, the Cultural Values Scale, and the School-Level Environment Questionnaire. Student participants were asked to complete the surveys, which included the Academic Motivation Scale, the Learning Self-Efficacy Scale, the Learned Helplessness Scale and the Utrecht Work Engagement Scale for Students. All questionnaires required approximately 20 minutes to complete. Interviews and classroom observations were subsequently conducted for the selected 20 teachers with highest and lowest mindset belief score. Each teacher participated in two interviews: one before and one after the classroom observation. Each interview lasted approximately 30 minutes and was conducted in the teacher's office or staff lounge. Classroom observations were conducted

once per teacher, lasting approximately one class period (around 40 minutes).

3.8 Researcher's Role

The author has utilized their knowledge and experience as a lawyer and teacher in Shanghai to examine the impact of agents on students. Working as a principal has provided the author with a broad perspective on the role of teachers and has led to an exploration of how teachers' beliefs and mindsets may affect student well-being and academic performance. The author argues that attention should be given to the spiritual and professional development of teachers in order to enhance the learning experiences and learning-related outcomes of students. The author's extensive experience of living and working in China has also facilitated their understanding of the local context, which has enabled them to offer unique perspectives and make a valuable regional contribution to the research. It is important to note that the school where the author previously worked is not involved in this study to prevent any potential conflicts of interest.

However, the author acknowledges that the interpretation of interview transcripts may be subject to different perspectives, particularly as the author may have a bias towards a Chinese way of thinking due to their cultural background and experience as a middle school teacher. The author therefore strives to maintain a neutral perspective to ensure the objectivity of the research, while also retaining the social context. As Walliman (2017) suggests, researchers should maintain an appropriate distance from the research subject to achieve objectivity. To achieve this, the author has employed discourse analysis when interpreting participants' words, which studies language in its social context and helps to mitigate the impact of the researcher's social background on the interpretation of the data. Discourse analysis is for studying written or spoken language in relation to its social context (Gee, 2010), and it reduces the impact of the researcher's social background on the objectivity of the study, in order to make sure there will not be misinterpretation or biased interpretation.

This approach allows the author to explore the meaning of words in their context and enhance the quality of the data analysis.

3.9 Ethical Approval and Data Protection

This study is being meticulously conducted under the vigilant oversight of the Human Research Ethics Committee (HREC) at the Education University of Hong Kong. Adhering to strict ethical standards, no part of the research procedure will commence without the prior ethical clearance and approval from the Human Research Ethics Committee. This stringent process ensures the safeguarding of the rights and well-being of all involved parties, including both the researcher and the participants. To elaborate, every facet of the research proposal has undergone a comprehensive review by the Human Research Ethics Committee. This includes a thorough evaluation of the research methodology, the participant consent forms, the Likert scale used for surveys, the interview and observation protocol forms, and all other pertinent documents. The Committee's approval underscores its commitment to maintaining high ethical standards throughout the study. Prior to initiating the research, participants are required to sign a detailed consent form and receive an information sheet. This process is designed to ensure participants fully understand their role, rights, and the nature of their involvement in the study. Highlighting that participation was entirely voluntary, individuals are informed that they have the autonomy to withdraw from the study at any stage, without any obligation to provide a justification for their decision. Further, participants retain the right to decline to answer specific questions or complete questionnaires if they so choose.

Regarding the handling of interview data, participants are afforded the opportunity to review the accuracy of the transcripts of their interviews. Moreover, the research strictly adheres to ethical guidelines by ensuring that no sensitive information related to topics such as violence or pornography is shared. Classroom observations are carried out in strict

compliance with the ethical rules of the local schools, and these observations will be ceased immediately upon any request.

In terms of data protection, all documentary data collected during the research is meticulously transformed into digital format and then securely destroyed using a shredder. The digital data is encrypted on the researcher's personal computer, rendering it inaccessible to unauthorized individuals. Access to this encrypted data is exclusively reserved for the researcher, who possesses the unique decryption key necessary to retrieve the original information as required. To further ensure confidentiality, participant identities are anonymized, and no names are disclosed publicly. In line with ethical research practices, the data will be securely stored for a duration of five years following the conclusion of the research. This comprehensive approach to data management and ethical considerations reflects the study's commitment to upholding the highest standards of research integrity and participant privacy.

3.10 Pilot Study and Modifications Made for Main Study

Undertaking a pilot study is a critical step in verifying the practicality and applicability of the methodologies proposed for the main body of research (Arain et al., 2010). In this research, a pilot study was meticulously executed to assess the reliability of scales such as Growth Mindset Inventory and Cultural Values Scale. Additionally, the pilot study was instrumental in evaluating the effectiveness and practicability of the protocols devised for interviews and classroom observations. It is important to acknowledge that the outcomes of this pilot investigation might not have always aligned perfectly with the hypothesized answers to the research questions. Several factors may have contributed to this discrepancy, including the relatively small sample size used in the pilot study and possible misinterpretations of questionnaire and interview content during the initial phase. These variables are crucial to consider, as they can significantly impact the results of the pilot study.

Furthermore, the pilot study served as an exploratory phase to identify and address any unforeseen challenges or obstacles that could arise during the main research. The findings from this initial phase were invaluable in refining the research methodology, ensuring that any necessary adjustments were made to enhance the overall quality and effectiveness of the research process (Day, 2012). By conducting this pilot study, the author was able to gain insightful feedback and practical experience, which were pivotal in optimizing the research design, improving the accuracy of the data collection instruments, and fine-tuning the logistical aspects of conducting the research.

A total of 62 middle school teachers were recruited for a survey from April to May in 2022 in Xuhui District, Shanghai. From this group, three teachers who scored at the extreme ends (highest and lowest) were chosen for more in-depth study through interviews and classroom observations. A total of 62 teachers (20 male, 42 female) participated in the study, aged between 22 and 40 years ($SD = 4.99$). The average teaching experience among the participants was 4.52 years ($SD = 2.51$). To ensure a diverse representation, teachers from 16 different schools teaching 12 varied subjects were selected for the study. Detailed demographic information about the participants, including gender, age, teaching experience, educational background, school affiliation, and their responses to the questionnaires and observations, is meticulously cataloged in Appendix J for readers interested in the intricate demographic dynamics of the sample population. The subsequent section details the modifications made to the research methodology based on the pilot study.

The administration of the questionnaires spanned from April 15th to April 29th. The reliability of the Growth Mindset Inventory and Cultural Values Scale was rigorously assessed using Cronbach's alpha. The overall alpha for the Growth Mindset Inventory stood at 0.75. Each theme within the Cultural Values Scale reflected Cronbach's alphas between 0.73 and 0.86, denoting good validity for the study. However, certain terminology in the

questionnaires, such as “criticism” in Q.6 and “intelligence cultivation” in Q.10 of interview, led to ambiguities among participant teachers. To rectify this and promote uniform understanding, specific terms were simplified without altering their original intent. For example, Q.6 was revised to “How do you view unfavorable judgment to students?” and Q.10 was rephrased to “What do you need to improve your understanding of intelligence belief?”

The semi-structured interviews, encompassing video recall interviews post-classroom observations, were conducted online from May 1st to May 3rd. Participants for the interviews were strategically selected based on their scores in the growth mindset theorist and mixed theorist (incremental biased) categories, with one participant representing the lowest scorer in the entity theorist type from Growth Mindset Inventory. Certain phrases in the interviews were also modified to enhance clarity and comprehension for local teachers. Terms like “cultural orientation” were replaced with “your cultural value” and “cultivation” was changed to “improving.” These revisions were found to be more comprehensible by the participants.

Regarding classroom observations, the pilot study revealed that May was not an ideal time for observations due to the proximity of the high school entrance exam in June, which typically results in a decrease in regular teaching activities. To avoid the constraints of exam preparation periods in future studies, alternative scheduling will be considered. Moreover, given the duration of a standard middle school lesson (less than 40 minutes including a 10-minute break), it was decided that formal classroom observations would ideally span at least two consecutive lessons (80 minutes) to ensure comprehensive data collection.

In conclusion, the aforementioned adjustments were implemented based on participant feedback, with the revised versions being validated by all participants. This was done to ensure that the language used in both the questionnaire and interview was free from ambiguities and easily comprehensible, thereby enhancing the overall quality and effectiveness of the research methodology.

3.11 Summary

This chapter presents a thorough overview of the methodology used in this research, elaborating on the decision to adopt a mixed methods approach, driven by its necessity to comprehensively answer the research questions. The discussion includes an examination of the feasibility and effectiveness of the research instruments employed. Notably, it explains the modifications made to these tools based on insights gathered from the pilot study. In addition, the section addresses potential limitations of the study, outlining the proactive measures taken by the researcher to counter these challenges. A significant emphasis is placed on ensuring the validity, reliability, and trustworthiness of the research instruments. This includes a detailed account of the steps taken to calibrate and validate these tools, ensuring they align precisely with the objectives of the study. The chapter also reflects on the benefits of the mixed methods approach in providing a more nuanced and comprehensive understanding of the research topic, highlighting the meticulous efforts to maintain methodological rigor and the integrity of the data collection and analysis process. Finally, a pilot study was conducted to play a role in testing and ensuring the feasibility and effectiveness of the research instruments.

Chapter 4 Results

4.1 Introduction

In this chapter, the presentation of results is organized to align with the sequence of research questions, instead of the sequence of research methods employed, facilitating a coherent and targeted analysis that correlates directly with the subsequent discussion chapter. The first section of results presentation is dedicated to addressing Research Question 1: “Do teachers with self-report as growth mindset show more growth mindset feedback in the classroom than those with a fixed mindset?” This section integrates both quantitative results from Growth Mindset Inventory and qualitative results from classroom observations to explore the possible difference of teachers’ feedback practices and their self-report mindsets. The qualitative results from teacher interviews, especially responses to questions about their perceptions of intelligence belief, strategies for addressing learning challenges, and their reflections on effort and criticism, are instrumental in enriching the understanding of how growth mindset qualities manifest in classroom interactions. Following this, the second section focuses on Research Question 2: “Do teachers’ cultural orientation and perceived school climate influence the formation of their mindset? This part primarily utilizes questionnaire results (Growth Mindset Inventory, Cultural Values Scale, School-Level Environment Questionnaire) to delve into the influence from cultural orientation, perceived school climate on teachers’ mindset beliefs. The third section addresses Research Question 3: “Is there a significant correlation between teachers’ growth mindset and students’ learning outcomes, and if so, do teachers’ cultural orientation and perceived school climate moderate such relationship?” Here, the quantitative analysis of questionnaire results (Academic Motivation Scale, Learning Self-Efficacy Scale, Learned Helplessness Scale, Utrecht Work Engagement Scale for Students) concerning student learning-related outcomes is

supplemented with insights into how cultural orientation and perceived school climate factors might influence this dynamic.

4.2 Overview and Results for Research Question 1

This section is for presenting results related to Research Question 1: Do teachers who self-report a growth mindset provide more growth mindset feedback in the classroom compared to those with a fixed mindset?" It presents quantitative results from Growth Mindset Inventory that capture teachers' self-reported mindsets, as well as quantitative results from classroom observations aimed at measuring the frequency of teachers' mindset feedback. Additionally, qualitative evidence from teacher interviews is included to explore teachers' underlying thought of their mindset. The overview of the results of Growth Mindset Inventory are presented in Table 5, and the descriptive statistics and the intercorrelations of the study variables for H1, which states that teachers with a growth mindset are more likely to provide growth mindset feedback in the classroom than those with a fixed mindset, in Table 6, while later Table 7 shows the results of multiple regression analyses.

Table 5 highlights that a substantial majority of the participants, 47.72% or 387 individuals, self-reported aligning with a growth mindset. A smaller proportion of the sample, representing 20.34% or 168 participants, self-reported with a mixed mindset. The remaining 31.94%, or 256 participants, reported having a fixed mindset.

Descriptive statistics and bivariate correlations among the variables relevant to H1 are presented in Table 6. The results show the participating teachers' average age was 29.77 years ($SD = 5.63$), with an average teaching experience of 8.13 years ($SD = 3.63$). Teachers' education levels averaged 16.53 years ($SD = 0.88$). Teachers' mindset belief had a mean score of 4.02 ($SD = 1.71$), indicating an inclination toward a growth mindset. Regarding feedback practices, growth mindset feedback had an average score of 12.63 ($SD = 2.05$), while neutral mindset feedback and fixed mindset feedback had mean scores of 4.18 ($SD = 1.51$) and 8.77

($SD = 1.85$), respectively. The correlation coefficients showed significant relations among key variables. Teachers' growth mindset was significantly positively related to growth mindset feedback ($r = 0.56, p < 0.001$), indicating that teachers with a higher self-reported growth mindset score tend to provide more growth-oriented feedback in classroom settings. Additionally, mindset belief was significantly negatively related to fixed mindset feedback ($r = -0.44, p < 0.001$), suggesting a relation between lower mindset belief scores and fixed mindset-oriented feedback. However, mindset belief had no significant relation with neutral mindset feedback ($r = 0.02, p > 0.05$), indicating no relation between mindset beliefs and neutral feedback practices. Growth mindset feedback and fixed mindset feedback were significantly negatively related ($r = -0.36, p < 0.001$), indicating that teachers who provide more growth-oriented feedback tend to reduce their use of fixed mindset feedback practices. Neutral mindset feedback showed no significant relations with either growth mindset feedback ($r = -0.05, p > 0.05$) or fixed mindset feedback ($r = 0.04, p > 0.05$), highlighting its relative independence from the other feedback types.

Table 7 presents the outcomes of the hierarchical regression analysis. Model 1, comprising demographic variables (age, gender, teaching experience, and educational background), indicated that these variables did not significantly explain the variance in the three types of feedback practices ($R^2 = 0.01\text{--}0.03, F(4, 806) = 1.12\text{--}1.31, p = 0.33\text{--}0.41$). None of the demographic variables had a significant effect on the feedback practices ($\beta = -0.02\text{--}0.03, p = 0.19\text{--}0.27$). In Model 2, after controlling for demographic variables, teachers' self-reported mindset beliefs were added. The findings indicated that teachers' self-reported growth mindset beliefs significantly predicted their use of growth mindset-oriented feedback practices. ($\beta = 0.49, \Delta R^2 = 0.11, \Delta F(5, 805) = 27.87, p < 0.001, f^2 = 0.34$), indicating that teachers who report stronger growth mindset beliefs are more likely to offer growth-oriented feedback. Conversely, self-reported mindset beliefs showed a significant

negative predictive power with fixed mindset feedback ($\beta = -0.31$, $\Delta R^2 = 0.09$, $\Delta F(5, 805) = 19.15$, $p < 0.001$, $f^2 = 0.22$), suggesting that teachers with lower self-reported growth mindset beliefs are more likely to provide fixed mindset feedback. However, self-reported mindset beliefs did not significantly predict the frequency of neutral mindset feedback practices ($\beta = 0.02$, $\Delta R^2 = 0.01$, $\Delta F(5, 805) = 1.17$, $p = 0.37$, $f^2 = 0.01$), thus, H1 is supported.

4.2.1 Results from Interview

Subsequently, results presentation for 20 teachers from interviews is provided, the teachers who participated in the interviews are described in terms of their demographic characteristics, which are summarized in Table 8.

According to the predetermined questions created by referencing growth mindset theory and other related literature discussed in section 2.3 and 2.4 (deductive data) and content (e.g., words frequency) from participants response in interviews (inductive data), seven major themes have emerged from the interview's analysis, there are: (1) intelligence is fixed or malleable quality; (2) learning is more about process or performance; (3) strategy used in classroom to encourage students to deal with challenges and obstacles; (4) feedback to students efforts made; (5) the role of teacher is a facilitator or controller; (6) contextual factors help or hinder teachers from implementing their belief in intelligence in classroom. Results from the interview in this study are presented through each of those themes. The appendix K provides sample coding for the interview, illustrating how responses were categorized and analyzed. This coding sample demonstrates the systematic approach used to identify key themes and patterns from the interview data, ensuring consistency and reliability in the analysis process. The coding was conducted by the author in collaboration with an expert in the field to enhance reliability and minimize potential bias. Interrater reliability was assessed using Cohen's Kappa, yielding a score of 0.78, indicating substantial agreement (Landis & Koch, 1977). Discrepancies below the 10% threshold were resolved through

discussion and consensus. Additionally, interviewees were invited to review their transcriptions to verify accuracy and ensure that their responses were faithfully represented. Any clarifications or corrections provided by the participants were incorporated into the final dataset to enhance data authenticity.

4.2.1.1 Intelligence Is Fixed or Malleable Quality

The thematic exploration of teachers' perceptions of intelligence revealed distinct differences between those with self-reported growth mindsets and those with self-reported fixed mindsets. These teachers saw their role as guiding students to recognize their potential for growth and encouraging them to persist through difficulties. Taking Elizabeth as an example:

A: Elizabeth (Growth Mindset Inventory score: 6), how do you think about intelligence, as growth or fixed quality?

Elizabeth: In my classroom, I make it clear that intelligence isn't fixed. I tell my students that their efforts and willingness to learn from mistakes are what truly define their intellectual growth. It's about constantly pushing boundaries and not being afraid to fail, as that's where real learning happens.

Similarly, Gabrielle reflected this perspective through her focus on challenges:

A: Gabrielle (Growth Mindset Inventory score: 6), do you think intelligence be changed or not?

Gabrielle: Absolutely, I believe intelligence can change and grow with effort. I often share with my students that what matters is not where they start, but how they approach their learning journey. I stress that their intelligence isn't fixed and that they can become smarter by being persistent and open to learning new things. My goal is to instill in them the mindset that they can always improve through effort and perseverance.

Conversely, the 10 teachers with self-reported fixed mindsets firmly believed that

intelligence is largely innate and immutable. They frequently emphasized the idea that individuals are born with a set level of intelligence that defines their potential. These teachers often viewed their role as recognizing and working within the natural limits of each student's abilities, rather than trying to fundamentally change those abilities. The following conversations illustrate this perspective:

A: Michael (Growth Mindset Inventory score: 2), how do you perceive the nature of intelligence, as growth or fixed quality?

Michael: I see intelligence as something you're born with and can't really change. Some students are naturally bright and catch on quickly, while others just don't, no matter how hard they try. It's my job to help each student reach their best within those limits, but I don't think you can push someone beyond their natural capabilities.

A: Nicole (Growth Mindset Inventory score: 2), do you believe intelligence levels can be altered?

Nicole: No, I think intelligence is pretty much fixed. You can work hard, sure, but there's only so much that effort can do. I've seen students try and still struggle, and others excel with little effort. I focus on what each student can realistically achieve, based on their natural strengths.

The thematic exploration of teachers' perceptions of intelligence revealed a clear divide between those with self-reported growth mindsets and those with fixed mindsets. Teachers with growth mindsets consistently emphasized the potential for intelligence to develop through effort, resilience, and learning from challenges. They believed their role was to inspire students to recognize their ability to grow intellectually and to persist in the face of difficulties. For example, both Elizabeth and Gabrielle emphasized that intelligence is not a fixed attribute, but rather a capacity that develops over time through sustained effort and dedication. In contrast, teachers with fixed mindsets viewed intelligence as largely predetermined and unchangeable. They emphasized that individuals are born with a specific

level of intelligence that sets the boundaries for their potential achievements. Teachers like Michael and Nicole expressed that their primary responsibility was to work within these natural limits, focusing on maximizing each student's capabilities without expecting significant changes in their intellectual abilities.

4.2.1.2 Learning Is More About Process or Results

The thematic exploration of teachers' perceptions on whether learning should prioritize the process, or the results revealed distinct differences between those with self-reported growth mindsets and those with fixed mindsets. Among the participants, 8 teachers with self-reported growth mindsets emphasized the importance of the learning process, acknowledging its crucial role in generating constructive learning outcomes and positively influencing students' motivation and self-efficacy. For example, Isabella, a teacher with a growth mindset, highlighted her belief in the intrinsic value of the learning process:

A: Isabella (Growth Mindset Inventory score: 6), what do you think about the purpose of learning, process or results?

Isabella: Our priority should be the learning experience of our students. It is through finding joy in learning that we can truly appreciate its pleasure, giving it genuine meaning. I believe that when students enjoy the process, they naturally develop the skills they need. Using learning purely as a means to achieve academic excellence, in my view, misses the true value of education.

Similarly, Francesca, another growth mindset teacher, expressed a similar perspective on the importance of the learning process:

A: Francesca (Growth Mindset Inventory score: 6), do you think learning is more about process or results?

Francesca: I've been exploring ways to integrate both, but my focus is on making learning engaging. I believe that when students are involved in the learning process, such as through interactive activities or games, they are more likely to develop a

deeper understanding. I try to shift the focus away from just achieving high scores to actually enjoying and engaging with the material.

Conversely, the remaining 7 teachers with self-reported fixed mindsets prioritized academic achievement, reflecting the education system's reliance on performance metrics to gauge progress. These teachers often viewed academic results as the primary indicator of success and tailored their teaching to meet these expectations. Quinn, for example, underscored the importance of achieving tangible academic outcomes:

A: Quinn (Growth Mindset Inventory score: 2), what do you think is more important in learning, the process or the results?

Quinn: Academic results are a more comprehensive and objective measure of a student's efforts. As a teacher, my responsibility is to ensure that students perform well and meet the required standards. The school evaluates us based on our students' performance, so focusing on results is crucial. I emphasize the need for students to do well on exams because that's what will help them succeed and be recognized.

Similarly, Patrick, another fixed mindset teacher, echoed this sentiment, highlighting her practical approach:

A: Patrick (Growth Mindset Inventory score: 2), do you think learning should focus more on the process or the results?

Brittany: I think it's about getting good grades at the end of the day. While it's nice to enjoy learning, the reality is that students need to achieve high scores to progress, especially given the competitive nature of school admissions. I align my teaching to ensure they are prepared for exams, which means focusing more on results than on the learning process itself.

Overall, the findings underscore a fundamental divide between teachers with growth and fixed mindsets regarding the emphasis on the learning process versus academic outcomes. Teachers with growth mindsets advocate for a richer, more engaging learning

experience, believing that a focus on the process fosters long-term intellectual and personal growth. In contrast, teachers with fixed mindsets prioritize academic performance, aligning their practices with the demands of an outcomes-driven educational system. This divergence highlights the broader implications of mindset on educational approaches and underscores the ongoing tension between nurturing intrinsic learning and meeting external performance standards.

4.2.1.3 Strategy Used to Encourage Students to Deal with Challenges and Obstacles

Within this theme, teachers exhibited distinct strategies based on their self-reported mindsets when addressing students' learning challenges and obstacles. Most teachers ($n = 8/10$) with growth mindsets emphasized the importance of using student-centered teaching methods to help students tackle learning difficulties. They focused on encouraging effort, guiding students through problem-solving processes, and building resilience by promoting persistence despite setbacks. For example, David, a growth mindset teacher, explained his approach:

A: David (Growth Mindset Inventory score: 6), how do you support students in overcoming learning challenges?

David: *Embracing* a student-centered approach allows us to tailor our teaching to meet each student's unique needs and learning styles. By doing so, we empower them to overcome their difficulties more effectively. It's about providing the right support at the right time and ensuring that every student feels capable in their learning journey.

Similarly, Catherine, another growth mindset teacher, highlighted her focus on effort rather than inherent ability:

A: Catherine (Growth Mindset Inventory score: 6), what strategies do you use to encourage persistence in your students when they encounter challenges?

Catherine: I often *tell* my students that it's their dedication and perseverance that matter most. For example, I had a student who excelled in math but occasionally got stuck. Instead of praising his intelligence, I would commend his effort, reinforcing the idea that hard work, not just natural talent, leads to success. This helps them see that they can overcome challenges by being persistent.

Conversely, most fixed mindset teachers ($n = 9/10$) tended to rely on more structured, school-prescribed strategies, often focusing on repetitive practice and adherence to standardized methods. These teachers felt constrained by institutional expectations and reported limited flexibility in adapting their teaching approaches. Owen, a fixed mindset teacher, described his reliance on school directives:

A: Owen (Growth Mindset Inventory score: 2), how do you address learning challenges in your classroom?

Owen: I find that repetition helps students become more confident in their abilities. When they encounter a challenge, I encourage them to keep practicing similar problems until they feel comfortable. It's less about exploring different methods and more about ensuring they know how to tackle the types of problems they'll face again. This way, they build a sense of competence through familiarity.

Rachel, another fixed mindset teacher, described her reliance on structured routines to support students:

A: Rachel (Growth Mindset Inventory score: 2), what strategies do you use to help students manage challenges?

Rachel: I stick to structured routines that I know work. If a student struggles, I guide them through the *steps* repeatedly until they get it. I believe in consistency—doing things the same way until it clicks for them. It's not about trying new approaches, but about mastering the one that works. This approach helps my students feel secure in what they're learning because it becomes predictable and manageable for them.

This distinction underscores the influence of teachers' mindsets on their instructional strategies. Growth mindset teachers prioritize adapting to student needs and encouraging exploration, while fixed mindset teachers favor predictability and repetition. These approaches reflect differing beliefs about the nature of learning and the best ways to support students through challenges, highlighting the complex interplay between mindset and teaching practices.

4.2.1.4 Teachers' Views About the Feedback on Students' Learning Progress, Student Critiques, and Peer Success

Teachers exhibited distinct approaches based on their self-reported mindsets when providing feedback on students' learning progress, delivering critiques, and discussing peer success. The majority of teachers (9/10) with growth mindsets emphasized the importance of process-oriented feedback, focusing on effort, learning strategies, and continuous improvement. These teachers believed that highlighting the learning process helps students understand the value of perseverance and adaptability. Hannah, a growth mindset teacher, explained her approach:

A: Hannah (Growth Mindset Inventory score: 6), what do you say to students when they make progress?

Hannah: I'm very careful about the feedback I give. I prefer encouragement over simple praise because praise often recognizes the outcome, which can boost confidence but doesn't necessarily teach the student about the value of the effort. Encouragement, on the other hand, increases confidence while also emphasizing the behavior that led to progress. For example, I might say, 'Your hard work is paying off—keep going!' instead of just saying 'Good job.'

A: Then how do you handle student critiques and discussions of peer success?

Hannah: When critiquing students or discussing peer success, I focus on being constructive and positive. For critiques, I might say, 'You've made some good

progress here, but let's look at how you can approach this part differently for even better results.' Regarding peer success, I frame it as a motivational tool, saying things like, 'Notice how your classmate has improved by applying consistent effort? What strategies from that can you use in your own learning?' This way, students learn to value the process and understand that success is achievable through persistence.

In contrast, most teachers (7/10) with fixed mindsets often provided feedback that praised innate ability, believing this approach to be the most effective in boosting students' confidence and motivation. They viewed affirming students' intelligence as a way to reinforce a positive self-image, which they felt would encourage further effort. Steven, a fixed mindset teacher, described her feedback strategy:

A: Steven (Growth Mindset Inventory score: 2), what do you say to students when they make progress?

Steven: I usually say something like, 'Well done, you clever boy/girl.' I believe that praising students for being smart helps build their self-confidence. When they feel recognized for their intelligence, they start believing they are capable of learning more, which encourages them to put in more effort and spend time studying.

Thomas, another fixed mindset teacher, shared a similar approach, emphasizing innate ability in his feedback:

A: Thomas (Growth Mindset Inventory score: 2), how do you provide feedback on students' learning progress?

Thomas: When I acknowledge a student's progress, I often highlight their intelligence by saying, 'You've really shown how smart you are with this improvement!' For critiques, I try to be positive, suggesting that their natural talent will help them overcome hurdles. I might say, 'With your sharp mind, I'm sure you'll work through this challenge.' When discussing peer success, I emphasize innate ability, telling students, 'Just like your classmate, you have the intelligence to

achieve great things if you apply yourself.’ My aim is to boost their self-esteem and motivate them by reinforcing that their inherent abilities are crucial to their success.

A: And how is your view about the discussion of peer success?

Thomas: When it comes to peer success, I think it can threaten my students’ confidence. They tend to compare themselves to their peers, and if others are doing well, they might feel like they’re not good enough.

Under this theme, it underscores the profound influence of teachers’ mindsets on their feedback strategies. Teachers who self-reported growth mindset beliefs tend to be more likely to foster classroom environments that prioritize persistence, adaptability, sustained effort, and flexibility, which in turn promote student persistence when encountering difficulties. In contrast, fixed mindset teachers prioritize innate abilities, aiming to build confidence through affirmations of intelligence, but this approach can sometimes lead to competitive comparisons that threaten students’ self-esteem. These differing approaches highlight the broader implications of a mindset on educational practices, suggesting that a focus on effort and learning processes may better support long-term student growth and engagement.

4.2.1.5 The Role of Teacher as A Facilitator or Controller

This theme indicated that teachers generally see their roles in the classroom as either facilitators or controllers. A facilitator is a teacher who designs activities and provides students with the freedom to take initiative and organize their learning without strict adherence to the teacher’s instructions. Conversely, a controller is a teacher who manages classes and activities strictly according to their instructions to maintain structure and ensure that learning objectives are met (Naibaho, 2019). Teachers with self-reported growth mindsets who preferred the facilitator role ($n = 8$) believed that allowing students more autonomy fosters their growth and independence. These teachers viewed their role as supporting students in becoming self-directed learners, emphasizing skills that go beyond

academic content. Gabrielle, a facilitator, explained her approach:

A: Why do you consider your role in the classroom as a facilitator?

Gabrielle: I want my students to learn how to teach themselves; it's a lifelong skill.

When they leave school, they'll encounter problems that aren't just about exams.

The learning skills they develop here will help them tackle real-life challenges, and that's what I aim to instill in them.

Brittany, another facilitator, echoed similar beliefs:

Brittany: I strongly believe in empowering my students to take charge of their learning. This not only prepares them for challenges outside the classroom but also builds responsibility and independence. By encouraging them to explore and discover on their own, I'm helping them develop critical thinking skills essential for their future success.

In contrast, the majority of teachers who preferred the role of a controller ($n = 8/10$) were aligned with a fixed mindset. These teachers emphasized the importance of maintaining strict control over the learning environment to ensure that lessons proceed according to plan and that all instructional objectives are met within set time frames. Laura, a fixed mindset teacher, described her approach:

A: Why do you consider your role in the classroom as a controller?

Laura: I provide clear goals for each lesson right from the start and instruct students to stick closely to the planned activities. For example, during class discussions, I manage the time strictly. If the discussion is going over time, I step in and move us along to ensure we cover all the necessary material within the lesson. This might dampen some students' enthusiasm to keep discussing, but it ensures we meet the lesson objectives.

Similarly, Owen, another teacher who sees herself as a controller, noted the impact of school expectations on her teaching style:

A: Do you consider your role in the classroom as a facilitator or controller?

Owen: I consider myself a controller because I believe that clear guidance and structured instruction are essential for effective learning. By maintaining control over the classroom activities, I can ensure that students stay focused, follow the plan, and achieve the lesson objectives. I feel that this approach allows me to manage the varying abilities and paces of my students more effectively, helping them to progress consistently and meet the expectations I set for their learning.

The findings reveal a clear divide between teachers who adopt a facilitator role and those who prefer a controller role, closely aligning with their self-reported mindsets. Facilitator teachers, primarily those with growth mindsets, focus on fostering students' autonomy, self-learning, and critical thinking skills. They view their role as guiding students to become independent learners, aligning more closely with Dweck's description of the growth mindset. On the other hand, controller teachers, mainly those with fixed mindsets, prioritize completing teaching tasks according to their predetermined plans and expect students to strictly follow their instructions. This approach is often influenced by school expectations and the pressure to meet academic standards within limited time frames. This contrast highlights how mindset influences teaching styles, with facilitator teachers valuing the development of lifelong learning skills over strictly adhering to set curricula.

4.2.1.6 Contextual Factors Help or Hinder Teachers to Implement Their Mindset in Classroom

Within the theme of how contextual factors influence the implementation of teacher mindsets, clear distinctions emerged between teachers with growth mindsets and those with fixed mindsets. Growth mindset teachers often face barriers in applying their beliefs due to school climates that prioritize high test scores and academic performance. These environments tend to be more aligned with fixed mindset approaches, where emphasis is placed on measurable outcomes and adherence to strict guidelines. As a result, fixed mindset teachers find it easier to translate their beliefs into classroom practices, whereas growth

mindset teachers struggle to implement their preferred strategies in such settings. Most of teachers (7/10) with self-reported growth mindsets indicated that they tend to adhere to the school climate rather than their personal beliefs when conflicts arise. The school climate, which heavily emphasizes high test scores and academic performance, creates significant challenges for these teachers. The pressure to achieve high scores and the competitive environment that ties student performance to teacher evaluations and promotions make it difficult for growth mindset teachers to implement growth-oriented practices. Jacob, a growth mindset teacher, highlighted this challenge:

A: Jacob (Growth Mindset Inventory score: 6), do you think contextual factors help or hinder you implementing your mindset in classroom?

Jacob: It hinders, I think the biggest challenge is the school's strong emphasis on test scores. There's a constant push towards prioritizing grades over genuine learning, which directly contradicts my translation of growth mindset in teaching. It feels like my hands are tied because the focus on scores limits my ability to fully implement growth mindset strategies. I often have to conform to policies that I don't agree with, just to stay aligned with the school's objectives.

Elizabeth, another growth mindset teacher, also expressed frustration with the lack of support and resources for implementing a growth mindset approach:

A: Elizabeth (Growth Mindset Inventory score: 6), do you think contextual factors help or hinder you from implementing your mindset in classroom?

Elizabeth: I have to say it hinders my implementation of my mindset in classroom. Despite my efforts to integrate a growth mindset approach in my teaching, the lack of support and training on this within our school has left me feeling somewhat lost and uncertain. It's challenging to navigate this on my own, especially when there's no clear guidance or encouragement from the school's side to promote these values. As a result, I find myself spending weekends searching the internet to learn more

about the growth mindset on my own, trying to fill the gap left by our school's lack of support in this area.

In contrast, teachers who self-reported as having fixed mindset often find the school environment more supportive of their beliefs and practices ($n = 8$). The emphasis on test scores and academic performance aligns closely with a fixed mindset approach, where the focus is on achieving measurable results and maintaining control over the learning process. This alignment makes it easier for fixed mindset teachers to implement their beliefs in the classroom without facing significant barriers. Nicole, a fixed mindset teacher, explained how the school environment supports her approach:

A: Nicole (Growth Mindset Inventory score: 2), do you think contextual factors help or hinder you in implementing your mindset in the classroom?

Nicole: I think the school environment actually helps me a lot. The focus on test scores and academic achievements aligns perfectly with my approach. It's all about getting students to reach those benchmarks, and the school's emphasis on performance gives me the structure and support I need to enforce this in my teaching. There's a clear expectation for results, and that suits my style of maintaining high standards and pushing students to perform at their best.

Patrick, another fixed mindset teacher, shared his perspective:

A: Patrick (Growth Mindset Inventory score: 2), do you think the local context helps or hinders you in applying your mindset in your teaching?

Patrick: For me, the school context is quite supportive. The priority here is on results, and that aligns well with my belief that intelligence and ability are relatively fixed. I don't waste time on things that might not directly improve test scores. Instead, I focus on drilling the right skills and knowledge because that's what the school values and what will get the students the results they need.

In addition, 9/10 self-reported growth mindset teachers highlighted the influence of Confucian cultural values, specifically long-term orientation, on their growth mindset implementation in classroom. They expressed that this long-term orientation reinforced their belief that intelligence can be cultivated over time and affirmed the value of sustained effort and perseverance. Gabrielle, a growth mindset teacher, explained how her cultural values impact her approach:

A: Gabrielle (Growth Mindset Inventory score: 6), do you think your cultural orientation helps or hinders you in applying your mindset in your teaching?

Gabrielle: I believe my cultural orientation strongly supports my approach. The emphasis on long-term goals and gradual progress really aligns with the idea of a growth mindset. It helps me to encourage my students to see learning as a journey, where their efforts today will shape their abilities in the future. This perspective deeply influences how I guide my students, constantly reminding them that every small step forward is valuable and contributes to their overall growth.

Similarly, Isabella shared her perspective on the influence of long-term orientation:

A: Isabella (Growth Mindset Inventory score: 6), do you think your cultural orientation helps or hinders you in applying your mindset in your teaching?

Isabella: My cultural orientation definitely helps me. The belief in incremental changes leading to significant progress over time mirrors the growth mindset perfectly. I always encourage my students to focus on consistent effort and improvement rather than immediate success. This long-term view helps me to instill patience and resilience in my students, teaching them that true learning and growth come from sustained effort and dedication.

On the contrary, 7/10 self-reported fixed mindset teachers highlighted the influence of a short-term orientation rooted in their cultural values, which emphasizes immediate results and tangible outcomes. This perspective aligns with a fixed mindset approach, where the

focus is on achieving visible success in the present rather than on long-term growth and development. These teachers often viewed their role as guiding students to maximize their immediate performance, aligning with the cultural emphasis on achieving short-term goals.

Rachel, a fixed mindset teacher, shared how this cultural orientation affects his teaching:

A: Rachel (Growth Mindset Inventory score: 2), do you think your cultural orientation helps or hinders you in applying your mindset in your teaching?

Rachel: In my culture, there's a strong emphasis on immediate success and measurable achievements, which fits well with my approach. I focus on ensuring my students excel in their current tasks and exams, as that's what's valued most. It's about making sure they meet the standards now, which is what matters in our educational context. I believe that emphasizing short-term success helps keep them motivated and aligned with what is expected.

Similarly, Nicole reflected on the impact of her short-term orientation on her teaching style:

A: Nicole (Growth Mindset Inventory score: 2), do you think your cultural orientation helps or hinders you in applying your mindset in your teaching?

Nicole: My cultural values emphasize getting results quickly, and that shapes how I approach teaching. I find it helps because I'm always looking for ways to help my students achieve success in the immediate sense. I tend to focus on getting them ready for the next test or assignment because those are the benchmarks we're judged by. In my view, achieving these short-term goals is crucial, and it's what I aim to instill in my students—the importance of excelling in the present, as it sets the foundation for future opportunities.

Under this theme, it suggests that growth mindset teachers encounter significant barriers in integrating their beliefs into classroom practices due to the school environment's emphasis on high test scores and rigid performance metrics. These teachers face challenges

such as a lack of autonomy and insufficient support, which hinder their ability to fully implement growth-oriented methods. The school climate often prioritizes immediate performance and short-term academic results, creating conflict for growth mindset teachers who aim to encourage resilience, embrace challenges, and focus on long-term student development. This misalignment makes it difficult for growth mindset teachers to foster a learning environment that values the process of learning over simply achieving high grades, underscoring the systemic challenges they face in translating their educational philosophies into practice within a results-driven context. In addition, cultural orientation plays a significant role: growth mindset teachers, influenced by a long-term outlook rooted in Confucian values, focus on continuous improvement and future success in their teaching. In contrast, fixed mindset teachers often align with a short-term orientation, emphasizing immediate results and performance, which directly influences their approach to teaching and how they perceive student success.

In all, this interview analysis highlighted distinct differences between growth and fixed mindset teachers across key themes. While growth mindset teachers promoted the idea that intelligence can be developed through effort and persistence, their practices were frequently constrained by institutional contexts that emphasized test scores and immediate academic results. These constraints limited their ability to fully implement growth-oriented practices, as they had to balance personal beliefs with external pressures. Conversely, fixed mindset teachers aligned their practices with the school's performance-driven standards, focusing on innate abilities and immediate, measurable outcomes. Cultural orientations also played a significant role: growth mindset teachers were influenced by Confucian values of long-term perseverance and continuous improvement, whereas fixed mindset teachers leaned towards a short-term outlook that prioritized immediate success and tangible results.

4.3 Results for Research Question 2

This section is dedicated to present results pertinent to Research Question 2: “Do teachers’ cultural orientation and perceived school climate influence the formation of their mindset?” It thus presents quantitative results derived from questionnaires (Growth Mindset Inventory, Cultural Values Scale, and School-Level Environment Questionnaire) that capture teachers’ self-reported mindsets, cultural orientation and perceived school climate. The following Table 9 shows intercorrelations of those variables.

As shown in Table 9, Chinese teachers in this sample predominantly reported a growth mindset ($M = 4.12$, $SD = 1.08$). They also displayed a strong inclination toward long-term orientation in cultural values, which yielded the highest mean score ($M = 4.57$) among all variables. A significant positive correlation was observed between long-term orientation and mindset beliefs ($r = 0.58$, $p < 0.001$), indicating that teachers with a stronger long-term orientation are more likely to endorse a growth mindset. In contrast, negative correlations were found between power distance ($r = -0.54$, $p < 0.001$) and uncertainty avoidance ($r = -0.46$, $p < 0.001$) with growth mindset, suggesting that teachers who lean toward these cultural orientations may be less likely to adopt a growth mindset. Notably, the average scores for power distance ($M = 4.09$, $SD = 1.68$) and uncertainty avoidance ($M = 4.05$, $SD = 1.53$) were relatively high among these teachers. No statistically significant correlations were found between growth mindset and individualism ($r = 0.02$, $p = 0.67$) or motivation towards achievement and success ($r = 0.02$, $p = 0.65$). Regarding teachers’ perceptions of school climate, mean scores suggested relatively low levels of participation in decision-making ($M = 2.06$, $SD = 0.48$) and support for educational resources ($M = 2.15$, $SD = 0.72$). Nonetheless, significant positive correlations emerged between teachers’ growth mindset beliefs and specific dimensions of school climate, including support for school resources ($r = 0.24$, $p = 0.007$), participation in decision-making ($r = 0.51$, $p < 0.001$), and instructional innovation ($r = 0.52$, $p < 0.001$). Additionally, a moderate positive correlation was identified between

growth mindset and learning motivation ($r = 0.35, p = 0.009$). No significant relationships were found between growth mindset and collaboration ($r = 0.03, p = 0.74$) or student relations ($r = 0.01, p = 0.85$). The results suggest that the Chinese teachers surveyed predominantly self-report a growth mindset and tend to align with long-term cultural value orientations. These findings—namely, the positive link with long-term orientation and negative associations with power distance and uncertainty avoidance—emphasize the shaping influence of cultural orientation on teachers' mindset beliefs. In terms of school climate, while teachers report lower involvement in decision-making and support for resources, their growth mindset is positively linked to support for resources, involvement in decision-making, and instructional innovation, indicating areas where school climate factors align with teachers' mindset beliefs. This supports Hypothesis 2 (H2), demonstrating that both cultural orientation and perceived school climate significantly influence teachers' mindset formation.

Tables 12 and 13 present the outcomes of the multiple regression analyses.

Demographic variables—including age, gender, teaching experience, and educational background—accounted for only a negligible proportion of the variance in growth mindset beliefs ($R^2 = 0.01$; $F(4, 806) = 2.02, p = 0.30\text{--}0.45$). Furthermore, none of these individual demographic factors exhibited a statistically significant predictive effect (β range = -0.01 to $0.03, p = 0.32\text{--}0.41$). With respect to cultural orientation (Table 10), after controlling for demographic influences in Step 1 and school climate dimensions in Step 2, the addition of cultural orientation variables in Step 3 significantly improved the model ($\Delta R^2 = 0.13, p < 0.001$; $\Delta F(5, 794) = 34.16, p < 0.001$). Specifically, long-term orientation emerged as a positive predictor of growth mindset beliefs ($\beta = 0.27, SE = 0.09, p < 0.001$), while power distance ($\beta = -0.26, SE = 0.08, p < 0.001$) and uncertainty avoidance ($\beta = -0.21, SE = 0.05, p < 0.001$) were significant negative predictors. By contrast, individualism ($\beta = 0.03, SE = 0.01, p = 0.38$) and achievement motivation ($\beta = 0.04, SE = 0.02, p = 0.36$) did not

significantly contribute to the prediction of teachers' mindset beliefs. Regarding the predictive effects of school climate variables (Table 11), after accounting for demographic variables in Step 1 and introducing cultural orientation factors in Step 2, the addition of school climate indicators in Step 3 significantly enhanced the model's capacity to explain teachers' growth mindset beliefs. ($\Delta R^2 = 0.11, p < 0.001$; $\Delta F(5, 794) = 29.51, p < 0.001$). Among the school climate dimensions, decision making ($\beta = 0.24, SE = 0.03, p < 0.001$) and instructional innovation ($\beta = 0.25, SE = 0.03, p < 0.001$) emerged as strong positive predictors. While school resources showed a positive correlation ($\beta = 0.08, SE = 0.03, p = 0.032$). In contrast, collaboration ($\beta = 0.01, SE = 0.02, p = 0.39$) and student relations ($\beta = 0.02, SE = 0.05, p = 0.37$) did not significantly contribute to the prediction of growth mindset formation. These findings provide support for Hypotheses H2a and H2b.

4.4 Results for Research Question 3

This section presents results related to Research Question 3 (including H3a and H3b) “Is there a significant correlation between teachers' growth mindset and students' learning-related outcomes, and if so, do teachers' cultural orientation and perceived school climate moderate the relationship?” It presents quantitative results based on the data collected by using the questionnaires that evaluate students' learning-related outcomes (i.e., Academic Motivation Scale, Learning Self-Efficacy Scale, Learned Helplessness Scale, Utrecht Work Engagement Scale for Students). The results concerning teachers' self-reported mindset belief, cultural orientation and perceived school climate, previously collected, are jointly presented in this section. The ensuing tables provide a detailed overview of the descriptive statistics, reliability estimates, and intercorrelations of the study variables (Table 12), as well as both the direct and moderating effects of cultural orientation (Table 13) and school climate (Table 14) regarding the relationship between teachers' mindset beliefs and students' learning-related outcomes. Furthermore, the accompanying figures illustrate the distinct

patterns of the dependent variable at higher ($M + 1 SD$) and lower ($M - 1 SD$) levels of the moderating variable.

Table 12 indicates mindset belief was significantly related to all learning-related outcomes, including learning motivation ($r = 0.47, p < 0.001$), learning self-efficacy ($r = 0.51, p < 0.001$), and learning engagement ($r = 0.53, p < 0.001$), while showing a significant negative correlation with learned helplessness ($r = -0.52, p < 0.001$). In addition, significant relationships were also observed between contextual factors and learning-related outcomes. Regarding cultural orientation, specific dimensions such as power distance and uncertainty avoidance were positively related to learned helplessness ($r = 0.44, p < 0.001$; $r = 0.43, p < 0.001$), but negatively related to learning motivation ($r = -0.45, p < 0.001$; $r = -0.41, p < 0.001$) learning self-efficacy ($r = -0.47, p < 0.001$; $r = -0.40, p < 0.001$) and learning engagement ($r = -0.45, p < 0.001$; $r = -0.43, p < 0.001$). On the contrast, another dimension (i.e., long-term orientation) was positively associated with learning motivation ($r = 0.41, p < 0.001$) learning self-efficacy ($r = 0.42, p < 0.001$) and learning engagement ($r = 0.44, p < 0.001$), but negatively related to learned helplessness ($r = -0.43, p < 0.001$). Regarding perceived school climate, school resources, decision making and instructional innovation were positively related to learning motivation ($r = 0.35, p = 0.005$; $r = 0.35, p = 0.006$; $r = 0.36, p = 0.004$), learning self-efficacy ($r = 0.38, p = 0.004$; $r = 0.33, p = 0.007$; $r = 0.34, p = 0.006$), and learning engagement ($r = 0.32, p = 0.008$; $r = 0.33, p = 0.007$; $r = 0.35, p = 0.005$), but negatively related to learned helplessness ($r = -0.38, p = 0.004$; $r = -0.37, p = 0.005$; $r = -0.40, p = 0.003$).

Table 13 presents the results of regression analysis for Hypothesis 3a. Model 1, comprising demographic variables (age, gender, teaching experience, and educational years), did not significantly predict any of the learning-related outcomes. Specifically, the R^2 values for Model 1 ranged from 0.02 to 0.04 across learning motivation, self-efficacy, learned

helplessness, and engagement, indicating limited explanatory power. The results of Model 2 illustrate that growth mindset belief was positively predictive of learning motivation ($\beta = 0.20, p = 0.009$), learning self-efficacy ($\beta = 0.23, p = 0.006$), and learning engagement ($\beta = 0.25, p = 0.004$), while negatively predictive of learned helplessness ($\beta = -0.24, p = 0.005$). The inclusion of growth mindset belief in Model 2 significantly improved model fit, with R^2 values increasing to 0.09 for learning motivation, 0.12 for self-efficacy, 0.13 for learned helplessness, and 0.14 for engagement. The ΔR^2 values ranged from 0.06 to 0.11 across these outcomes. With respect to the moderating effects of cultural orientation, Model 3 demonstrated a notable improvement in explanatory power ($\Delta R^2 = 0.11\text{--}0.13$), with interaction terms further refining the relationships. Specifically, power distance negatively moderated the relationship between growth mindset belief and learning motivation ($\beta = -0.20, p = 0.008$), self-efficacy ($\beta = -0.21, p = 0.007$), engagement ($\beta = -0.20, p = 0.008$), and strengthened its negative effect on students' learned helplessness ($\beta = -0.20, p = 0.008$). Similarly, uncertainty avoidance also negatively moderated the effect of growth mindset belief on learning motivation ($\beta = -0.18, p = 0.011$), self-efficacy ($\beta = -0.18, p = 0.011$), engagement ($\beta = -0.16, p = 0.012$) and strengthened its negative relationship with students' learned helplessness ($\beta = -0.17, p = 0.011$). However, individualism, motivation towards achievement and success did not significantly moderate the relationships between mindset belief and any learning-related outcomes ($p > 0.05$). Finally, long-term orientation positively moderated the relationships between mindset belief and learning motivation ($\beta = 0.21, p = 0.007$), self-efficacy ($\beta = 0.22, p = 0.006$), engagement ($\beta = 0.23, p = 0.005$), and weakened its negative relationship with students' learned helplessness ($\beta = -0.22, p = 0.007$). The inclusion of these interaction terms in Model 3 significantly improved the explained variance, with R^2 values increasing to 0.21 for learning motivation, 0.25 for self-efficacy, 0.24 for learned helplessness, and 0.27 for engagement. F values also showed substantial

improvement in Model 3, ranging from 53.92 for learning motivation to 68.31 for engagement, all highly significant ($p < 0.001$). H2a is supported.

Table 14 presents the results for Hypothesis 3b. Models 1 and 2 are the same as those in Table 13, including identical control variables and the main effect of mindset belief. The difference lies in Step 3, where distinct interaction terms were added to test different moderators. The moderating effects of perceived school climate dimensions were tested in Model 3, which demonstrated a significant improvement in explanatory power ($\Delta R^2 = 0.09$ – 0.12). Among the school climate dimensions, school resources significantly moderated the relationship between mindset belief and learning motivation ($\beta = 0.19, p = 0.012$), self-efficacy ($\beta = 0.23, p = 0.005$), engagement ($\beta = 0.15, p = 0.017$), and weakened its negative relationship with students' learned helplessness ($\beta = 0.20, p = 0.014$). Decision making also significantly and positively moderated these relationships, enhancing the effect of growth mindset belief on learning motivation ($\beta = 0.19, p = 0.011$), self-efficacy ($\beta = 0.16, p = 0.019$), engagement ($\beta = 0.15, p = 0.018$), but weakening its negative relationship with students' learned helplessness ($\beta = 0.18, p = 0.021$). Instructional innovation demonstrated a similar pattern by showing a positive moderating effect on the relationship between growth mindset belief and learning motivation ($\beta = 0.20, p = 0.011$), self-efficacy ($\beta = 0.17, p = 0.014$), engagement ($\beta = 0.17, p = 0.012$), but weakening its negative relationship with students' learned helplessness ($\beta = 0.21, p = 0.009$). Collaboration and student relations did not significantly moderate the relationships between mindset belief and any learning-related outcomes, as their coefficients ($\beta = 0.01$ – 0.03) were not significant ($p > 0.05$). The inclusion of these interaction terms in Model 3 significantly improved the explained variance, with R^2 values increasing to 0.19 for learning motivation, 0.24 for self-efficacy, 0.21 for learned helplessness, and 0.25 for engagement. F values for Model 3 ranged from 48.15 for learning motivation to 65.21 for engagement, all highly significant ($p < 0.001$). H2b is supported.

The visual representation of the aforementioned moderating effects is shown in Figures 7-10, where each panel represents the interaction between growth mindset and specific moderators on learning-related outcomes.

Figure 7 illustrates how different dimensions of cultural orientation moderate the relationship between growth mindset and teachers' motivation for learning. Panel A shows that high power distance reduces the positive impact of growth mindset on learning motivation compared to low power distance. Similarly, Panel B demonstrates that high uncertainty avoidance weakens the positive relationship, while low uncertainty avoidance strengthens it. Panel C indicates that high long-term orientation amplifies the positive impact of growth mindset on learning motivation, whereas low long-term orientation results in a weaker effect. Panels D, E, and F illustrate the moderating effects of perceived school climate dimensions, where higher levels of school resources, decision-making, and instructional innovation enhance the positive relationship between growth mindset and learning motivation compared to lower levels.

Figure 8 visualizes the moderating effects on learning self-efficacy. Panel A reveals that high power distance diminishes the relationship between growth mindset and self-efficacy, while low power distance strengthens it. Panel B shows a similar pattern for uncertainty avoidance, with low levels enhancing the relationship and high levels weakening it. Panel C highlights the positive influence of high long-term orientation on the relationship, while low levels show a weaker effect. Panels D, E, and F illustrate that high levels of school resources, decision-making, and instructional innovation significantly enhance the impact of growth mindset on learning self-efficacy compared to their lower counterparts.

Figure 9 depicts the moderating effects on learned helplessness. Panels A and B show that high power distance and high uncertainty avoidance exacerbate the negative relationship

between growth mindset and learned helplessness, while low levels of these moderators reduce helplessness more effectively. Panel C demonstrates that high long-term orientation strengthens the negative effect of growth mindset on learned helplessness, whereas low levels weaken this effect. Similarly, Panels D, E, and F show that high levels of school resources, decision-making, and instructional innovation reduce learned helplessness more effectively than low levels of these moderators.

Figure 10 illustrates the moderating effects on learning engagement. Panel A shows that high power distance weakens the positive relationship between growth mindset and engagement, while low power distance strengthens it. Panel B indicates a similar pattern for uncertainty avoidance. Panel C demonstrates that high long-term orientation amplifies the positive relationship between growth mindset and engagement, while low levels diminish it. Panels D, E, and F reveal that higher levels of school resources, decision-making, and instructional innovation enhance the positive relationship between growth mindset and engagement more effectively compared to their lower levels.

Collectively, the results reveal that both cultural orientation and perceived school climate shape the extent to which growth mindset beliefs affect learning-related outcomes, highlighting their moderating roles.

4.5 Summary

This chapter presents both quantitative and qualitative results in alignment with the sequence of research questions proposed. H1, H2a, H2b and H3a, H3b are supported. The subsequent section is structured to synthesize and interpret the results presented in this Chapter, aiming to respond to the research questions.

Chapter 5 Discussion

5.1 Introduction

This chapter addresses the research questions (Section 1.3) through a synthesis and interpretation of the results retrieved from Chapter 4, including questionnaires, semistructured interviews, and classroom observations. The relevant key literature discussed in Chapter 2 is incorporated to provide context and support for the findings, and the major limitation of the findings is also expounded. Finally, a general discussion, implications and future research recommendations are provided to further explain the results.

5.2 Responding to the Research Questions

5.2.1 Research Question 1: Do Teachers with a Growth Mindset Quality Show More Growth Mindset Feedback in the Classroom Than Those with a Fixed Mindset Quality?

The quantitative results obtained through the administration of questionnaires, coupled with qualitative results garnered from classroom observations, suggest that teachers who self-report as incremental theorists offer more growth mindset feedback in the classroom than do those who identify as entity theorists (see Table 7). This finding implies that teachers' mindset beliefs can be translated into corresponding mindset feedback, which is presented mainly by ability-focused teaching pedagogy. Regarding specific teaching feedback, the findings indicate that the main differences in classroom behavior between the two groups of teachers are reflected in their feedback on students' learning challenges and progress. Incremental teachers tend to encourage students to face challenges and affirm their efforts in the process of progress, whereas entity teachers tend to encourage students to avoid challenges and praise their innate ability to provide feedback on students' progress. Thus, H1, which states that teachers with a growth mindset are more likely to provide growth mindset feedback in the classroom than those with a fixed mindset (see Section 1.3), is supported.

Interestingly, the results also suggest that although incremental theorists demonstrated

higher levels of growth mindset feedback, all teachers exhibited mixed mindset feedback to varying degrees. This reveals an incongruity between teachers' mindset beliefs and their outward feedback in real classroom practice. For example, a case example of an incremental teacher illustrated her response to student progress as "you are clever," which is construed as an entity expression in a growth mindset (praising for inner ability). Similarly, a teacher who self-reported as an entity theorist was observed to encourage students to put more effort when facing diverticulitis in this study, which is considered growth mindset feedback in the same theory.

However, this research reveals that the aforementioned incongruity could lend support to Dweck and Bempechat's (2017) Hypothesized Model for the Socialization of Implicit Theories of Intelligence (see Section 2.3). Specifically, in instances in which a teacher's personal theory of motivation conflicts with their belief in a fixed or growth mindset, their conduct may exhibit inconsistencies with the feedback associated with a particular mindset belief. Importantly, this does not necessarily imply a lack of possession of the relevant mindset quality but rather suggests that their actions are constrained by an alternate motivational theory. Within the context of this study, this restriction is attributed to the absence of growth mindset training in the school system, which leaves educators with no choice but to adhere to their own self-theory of motivation.

Overall, the findings point to an incomplete alignment: while teachers reported endorsing a particular mindset, the feedback they provided in actual classroom practice did not consistently reflect those beliefs. While the findings reveal a general trend that teachers with a growth mindset are more inclined to offer growth mindset feedback, the presence of mixed feedback patterns across both mindset groups speaks volumes about the multifaceted influences shaping mindset feedback in teaching practice. Interestingly, this inconsistency does not undermine the validity of Dweck's (1999, 2006) theory of growth mindset but

rather enriches its interpretation, suggesting that mindset orientation is not a straightforward determinant of classroom behavior. Perceived external and internal factors, such as the perceived prevailing school climate settings or deeply rooted personal motivational beliefs, might modulate mindset-related practices. With respect to existing research, this finding confirms prior studies that have highlighted the misalignment between teachers' beliefs about intelligence and feedback teaching practices (Foliano et al., 2019; Haimovitz & Dweck, 2017; Rissanen et al., 2019). This particular finding uniquely contributes to the literature by focusing on middle school teachers in mainland China and offering deeper insights into the mechanisms driving this misalignment.

5.2.2 Research Question 2: Do Teachers' Cultural Orientation (2a) and Perceived School Climate (2b) Influence Their Mindset of Intelligence?

The findings of this study indicate that teachers' mindset toward intelligence is influenced by their cultural orientation and perceived school climate. As detailed in Table 9, incremental teachers showed a strong positive correlation with long-term orientation. This dimension of orientation achieved the highest mean score. However, teachers' mindset of intelligence was negatively correlated with power distance and uncertainty avoidance. When observing the school-level climate, teachers' growth mindset was positively correlated with school resources, decision-making, and instructional innovation. However, the present study also revealed low mean scores for available school resources ($M = 2.15/5$) and teachers' decision-making authority ($M = 2.06/5$).

These findings elucidate the intricate relationship between cultural orientation and the school-level climate in molding teachers' mindset beliefs. Insights from interviews (see Section 4.3) suggested that when school-imposed educational directions, such as performance-focused pedagogy, stand at odds with teachers' mindset beliefs, educators often succumb to prioritizing school mandates. This inclination intensifies due to cultural

tendencies toward conformity and reliance on structured decision-making hierarchies (see also Section 4.3). As a result, some educators relegated their intrinsic mindset beliefs, gravitating toward a more fixed mindset.

The association between the school climate and teachers' mindset emphasizes the crucial role of school resources, decision-making autonomy, and innovation in crafting and bolstering a growth mindset. The interviews (refer to Section 4.3) revealed a palpable scarcity in growth mindset training resources for teachers, leading to feelings of isolation and limiting their capacity to incorporate and champion growth mindset ideologies effectively in their classrooms. Additionally, this study noted the positive correlation between instructional innovation and teachers' growth mindset, which was the highest value; however, it was low, with $M = 2.13$ and $SD = 0.46$ among all the school climate variables. Delving deeper into this through interviews (refer to Section 4.3), a recurrent sentiment emerged among educators, suggesting that schools mired in traditional pedagogical methodologies might be less conducive to fostering a growth mindset. The unwillingness or inability of some schools to adapt, experiment, or provide teachers with the latitude to explore novel teaching methods potentially stymies the nurturing of a growth mindset among educators. Essentially, a school's openness to instructional innovation seems intrinsically linked to the cultivation of a growth-centric outlook in its teaching cadre. A progressive, innovative environment not only stimulates a teacher's professional growth but also provides fertile ground for the growth mindset to thrive. In contrast, an institution's adherence to outdated, rigid teaching paradigms might inadvertently suppress or overshadow a teacher's intrinsic growth mindset beliefs.

In relation to the research question, H2, which states that teachers' cultural orientation and perceived school climate influence the formation of their mindset (refer to Section 1.3), is supported in this research. Moreover, the results resonate with earlier studies that highlighted the context-sensitive nature of growth mindset theory (Zhang & He, 2024a). The primary

value of these findings lies in illuminating the complex interplay between cultural orientation, the school climate, and the evolution of teachers' mindset beliefs. Specifically, these outcomes hint at the dual role of context: it can either bolster or inhibit the development of a teacher's growth mindset. Furthermore, this study revealed that while long-term cultural orientations (akin to Confucianism) tend to nurture a teacher's growth mindset, diminished teaching autonomy and limited school resources could undermine its potency.

Overall, teachers' mindset belief is influenced by their cultural orientation and perceived school climate, which aligns with previous research (Zhang & He, 2024a). Moreover, this study identified specific cultural dimensions associated with teachers' growth mindset. In relation to cultural orientation, a growth mindset was positively associated with long-term orientation and negatively associated with both power distance and uncertainty avoidance. However, no significant relationship was found with individualism or motivation for achievement and success. With respect to the perceived school climate, teachers' growth mindset was positively linked to school resources, decision-making, and instructional innovation but was not significantly associated with collaboration or student relationships. However, given the cross-sectional and correlational nature of this study, alternative explanations should be considered. It is possible that teachers' mindset beliefs also contribute to shaping the broader school climate or that external factors—such as educational policies or leadership structures—jointly influence both variables. This study advances the understanding of the associations between teachers' mindset beliefs and perceived contextual factors, including cultural orientation and school climate, aligning with Yeager's assertion that “unexplained heterogeneity should be a starting point for future theory development” (Yeager et al., 2020, p.1273), thereby addressing a critical gap in the current body of research regarding the formation of teachers' mindsets.

Additionally, this study revealed that the relationships between teachers' mindset

beliefs and cultural dimensions such as individualism, motivation for achievement and success, collaboration, and student-teacher relations were not significant. These dimensions may not inherently enhance or limit the adoption of a growth mindset but rather influence its expression within the cultural context. For example, in individualistic or collectivistic cultures, teachers may direct growth mindset efforts differently and focus on personal or communal resilience, respectively (Sagy et al., 2001). Similarly, in masculine or feminine cultures, mindset beliefs may favor competitive self-improvement or collective growth (Hofstede, 1986; Paechter, 2006). High or low collaboration levels and the quality of student relations may also shape how a growth mindset manifests in teaching practices (Sutton & Shouse, 2016; Allen et al., 2021). Further investigation is needed to elucidate these nuanced influences.

5.2.3 Research Question 3: Is There a Significant Relationship between Teachers' Growth Mindset and Students' Learning-related Outcomes? If So, Do teachers' Cultural Orientation (3a) and Perceived School Climate (3b) Moderate the Relationships?

The findings demonstrate that teachers' growth mindset beliefs are positively and significantly linked to students' learning-related outcomes. As shown in Table 11, for example, teachers' growth mindset and students' learning motivation are positively related. This finding indicates that teachers with a growth mindset tend to foster an environment where students are more likely to use motivated strategies for learning. Similarly, teachers' growth mindset and students' learning self-efficacy are positively correlated. This suggests that when teachers believe in and encourage the development of abilities through effort and perseverance, it positively influences students' beliefs in their own learning capabilities. Additionally, the relationship between teachers' growth mindset and student engagement is positively correlated, implying that students are more engaged in the learning process when

their teachers adopt a growth mindset. On the other hand, a negative correlation is observed between teachers' growth mindset and students' sense of learned helplessness. This finding indicates that the presence of a growth mindset in teachers is associated with a decrease in students' feelings of helplessness in their learning processes. This finding resonates with those of recent studies (Yeager et al., 2022; Zeng et al., 2019), further emphasizing the importance of teachers' growth mindset in influencing student learning outcomes.

Moreover, the findings reveal that teachers' cultural orientations and perceptions of the school climate significantly moderate the relationship between their mindset belief and various student learning-related outcomes, including learning motivation, learning self-efficacy, learned helplessness, and learning engagement. While previous studies have focused primarily on the predictive effects of cultural orientation and perceptions of the school climate on teacher mindset (Zhang & He, 2024a), this study extends the literature by revealing the moderating effects of contextual factors. The interview results (refer to Section 4.2.2) may explain these moderating effects, particularly regarding the role of long-term orientation in strengthening teachers' growth mindsets in relation to students' learning motivation, learning self-efficacy, and learning engagement while lessening learned helplessness. Teachers such as Isabella emphasized this influence, describing how her cultural value of long-term goals aligns with a growth mindset and allowing her to guide students toward sustained effort and gradual improvement. As she explained, "I encourage my students to focus on consistent effort and improvement rather than immediate success," helping them see learning as a journey and reinforcing the belief that abilities can grow with time and dedication. This suggests that teachers who have a long-term perspective are better equipped than other teachers to nurture a growth mindset in students since they emphasize perseverance and gradual improvement over immediate outcomes.

Similarly, the interview results (refer to Section 4.2.2) suggest possible explanations

for the negative moderating effects of cultural preferences for power distance and uncertainty avoidance on the relationships between teachers' growth mindsets and learning motivation, learning self-efficacy, learned helplessness, and learning engagement. For example, teachers such as Rachel, who view intelligence as fixed, indicated that a high power distance culture—which emphasizes hierarchy and control—contributed to their reluctance to deviate from established norms. Rachel noted, “I focus on ensuring my students excel in their current tasks and exams because that’s what’s valued most,” indicating how a short-term orientation rooted in her cultural values aligns with a performance-driven approach that prioritizes immediate results over long-term growth. This cultural inclination limits teachers’ flexibility and hinders interactive, growth-oriented practices that could enhance students’ learning-related outcomes. These findings highlight that high power distance and uncertainty avoidance may constrain teachers’ ability to implement growth-oriented practices, ultimately shaping students’ learning experiences. While previous research (Zhang & He, 2024a) has focused primarily on how cultural orientation is linked to teachers’ growth mindset, this study extends the literature by examining how cultural orientation and school climate moderate the relationship between teachers’ mindset beliefs and students’ learning-related outcomes.

The study also highlights school climate factors as significant moderators, with the interview results (refer to Section 4.2.2) providing further context. For example, abundant school resources, decision-making autonomy, and instructional innovation positively moderated the associations between teachers’ growth mindsets and learning motivation, learning self-efficacy, learning engagement, and reduced learned helplessness. Teachers such as Jacob illustrated this dynamic, sharing that while he values growth mindset principles, he often faces challenges due to the school’s strong emphasis on test scores, which he described as a constraint on fostering genuine learning. Jacob explained, “There’s a constant push toward prioritizing grades over genuine learning, which directly contradicts my translation of

growth mindset in teaching.” Similarly, teachers such as Elizabeth expressed frustration with limited support for growth-oriented teaching, noting that the lack of school resources hinders her ability to fully implement growth mindset strategies. She shared, “I find myself spending weekends searching for growth mindset resources on my own,” reflecting the challenges of working within a performance-focused school climate. These insights suggest that supportive school climates with ample resources and teacher autonomy are instrumental in facilitating the application of growth mindset practices, thereby fostering a more engaging and resilient learning environment for students.

In relation to the literature (Sun et al., 2021), which indicates a relationship between growth mindset implementation and perceived contextual factors, this study further reveals how teachers’ growth mindset, shaped by cultural orientation and perceived school climate, impacts students’ learning-related outcomes. Specifically, the findings suggest that the effectiveness of a mindset-plus-supportive-context framework (Yeager et al., 2022)—that is, the extent to which a growth mindset is reinforced by a conducive cultural and perceived school environment—is essential for maximizing the benefits of growth mindset practices. Cultural values such as long-term orientation and collaboration enable teachers to foster positive learning-related outcomes more effectively. In contrast, high power distance and uncertainty avoidance restrict flexible, growth-oriented teaching, highlighting the role of context in either facilitating or constraining mindset applications. These insights emphasize that a holistic approach—addressing both individual teacher mindsets and the broader environment—is crucial for realizing the full potential of a growth mindset in education.

5.2.4 Summary of Findings

In summary, this thesis reveals important findings about the influence of teachers’ mindset beliefs on classroom practices and students’ learning-related outcomes. This research

has shown that teachers who possess a growth mindset are more likely to provide growth mindset feedback in their classrooms than are those with a fixed mindset (H1). However, teachers' stated beliefs about intelligence and the feedback observed in their classrooms are not completely aligned; all participating teachers showed mixed mindset feedback, including a growth mindset and neutral and fixed mindset teaching practices. The qualitative findings suggested that this discrepancy may be due to teachers' feedback being shaped by their personal theories of motivation, as revealed in the interviews. This implies that the perceptions and beliefs teachers hold about individual students could significantly impact the type of feedback given. This aspect calls for further research to fully understand its implications. Moreover, the study emphasizes how cultural orientations and school climates shape teachers' beliefs about intelligence (H2). For example, a culture emphasizing long-term orientation was found to nurture teachers' growth mindsets, whereas constraints such as limited educational resources and a lack of innovation emphasis were found. were seen to limit their effectiveness. Additionally, these contextual factors were identified as moderators in the relationship between teachers' mindset beliefs and students' learning-related outcomes (H3). For example, positive factors such as a long-term orientation and rich school resources strengthen the relationship between teachers' growth mindsets and students' learning self-efficacy. In a broader context, this research contributes significantly to the existing body of knowledge by examining how teachers' mindset beliefs affect students' learning outcomes. The results suggest that fostering a growth mindset in teachers leads to more positive impacts on students' learning than a fixed mindset does. Importantly, this research highlights the importance of accounting for contextual perceptions when examining how teachers' mindset beliefs are related to student learning-related outcomes.

In relation to the literature (refer to Sections 2.3 & 2.4), the findings provide the following insights. First, the results support the Hypothesized Model for the Socialization of

Implicit Theories of Intelligence (Haimovitz & Dweck, 2017), although this finding is beyond the focus of the research. This model posits that teachers are influenced by two concurrent activations: their intelligence mindset and their individual theory of how to motivate children (Haimovitz & Dweck, 2017). The study demonstrated that these dual influences may lead to a nonaligned relationship between teachers' mindset beliefs and their actual teaching practices. This misalignment could be partly attributed to measurement issues, although the current research did find that teachers who self-reported having a growth mindset provided more growth-oriented feedback than those who self-reported a fixed mindset. Second, the results highlight the powerful role of cultural orientation and school climate in influencing teachers' belief systems. In accordance with the teacher ecology framework (Buehl & Beck, 2014) and a recent empirical study (Zhang & He, 2024a), the findings illustrate that teachers' mindset formation is significantly shaped by contextual dimensions, particularly cultural orientation and perceived school climate. Thus, this study offers a novel contribution by investigating how teachers' cultural orientation and perceptions of the school climate serve as predictors in the development of a growth mindset—an aspect that remains underexplored in current research. Third, the findings offer potential explanations for counterintuitive discoveries in the current literature, specifically addressing the possible reasons behind the failed replication of growth mindset effects on positive academic outcomes. One such explanation is the moderating effect of contextual factors. The study suggests that cultural orientation and perceived school climate can significantly influence the relationship between teachers' mindset belief and students' learning-related outcomes. This finding aligns with those of previous research, which have suggested contextual heterogeneity within growth mindset theory (Zhang et al., 2020; Zhang & He, 2024a). Furthermore, this finding provides additional evidence for its moderating effect. This insight highlights the complexity of applying growth mindset theory in diverse educational

settings and highlights the need to consider contextual contexts when evaluating their impact. This finding corroborates Buehl and Beck's (2014) model, providing empirical evidence for the contextual sensitivity of growth mindset theory. Collectively, the findings add depth to the discussion on the growth mindset by illustrating that its effectiveness and applicability are not universal but vary according to specific contexts.

5.3 Theoretical Implications

5.3.1 Understanding Intelligence in Growth Mindset Theory

The way that intelligence is understood within the framework of growth mindset theory is notably ambiguous. Dweck's foundational work (1999, 2006) highlighted the need for a clearer definition, emphasizing that intelligence is seen as flexible by those who believe in incremental growth and static by those who hold entity theories. However, despite these distinctions, a universally agreed-upon and precise definition of intelligence is still lacking in the literature on the growth mindset (Costa & Faria, 2018). Having a well-articulated definition of intelligence is crucial for the consistency of research and the clarity of methodologies. How intelligence is interpreted can lead to widely varying behaviors. For example, seeing intelligence as a tool for social adaptation might prompt behaviors focused on improving social standing. On the other hand, defining intelligence in terms of survival skills may lead to behaviors centered on self-preservation and resilience, as Sternberg suggested (1999). This perspective seems to be absent in current growth mindset research. While studies such as those by Blackwell, Trzesniewski, and Dweck (2007) have connected implicit intelligence beliefs to academic achievement, the specific conceptualization of intelligence remains underexplored. To the best of available knowledge, follow-up studies by Dweck and Yeager (2020) have not fully examined how individual beliefs about intelligence correlate with their understanding of intelligence. An intriguing question arises: How can the adoption of a growth mindset and corresponding feedback be assessed or understood when

teachers view intelligence through different lenses? The challenge is to find consistent and accurate methods to capture the subtleties in teachers' views on intelligence and how these perceptions translate into their teaching methods and student interactions.

Thus, this study proposes that the observed behavioral patterns may not directly reflect individuals' beliefs about the nature of intelligence. Instead, these behaviors might respond to the prevailing operational definitions of intelligence. For example, the results of the present study indicates that teachers mostly viewed intelligence as a combination of inherent genetic factors and effort after birth, regardless of whether they subscribed to entity or incremental theories. This aligns with the research by Cutler (2021), who reported that teachers' definitions of intelligence often include both innate ability and environmental influences. In situations where teachers with entity-oriented beliefs still encouraged students to work hard in the face of learning challenges, this effort—typically associated with the feedback of incremental intelligence—seems more influenced by teachers' practical understanding of intelligence than their theoretical beliefs. This distinction underlines the importance of establishing a clear and consistent definition of intelligence in future research on the growth mindset. This is crucial, as the literature, including that of Pretzlik et al. (2003), has shown that a teacher's concept of intelligence is linked to how students see themselves. Similarly, Zhang et al., (2017) argue that students' learning mindsets are closely tied to how intelligence is framed within educational settings. Defining it in this way enables a more refined analysis of how implicit beliefs about intelligence relate to actual behavioral patterns, helping to discern whether these behaviors truly reflect individual beliefs about intelligence or are shaped by wider, often unspoken, definitions prevalent in educational and psychological settings.

5.3.2 Oversimplified Growth Mindset Theory's Framework

The growth mindset framework serves as a theoretical lens that categorizes

individuals as either incremental or entity theorists on the basis of how they conceptualize intelligence and distinguishes them through the behaviors they demonstrate. However, this study revealed that the practical application of the growth mindset framework was overly simplistic and lacked consideration of the complexity of behavior elicitation. The results of the study support the ecology model (Deuhl & Beck, 2014), which implies that the framework of a growth mindset has limited exploratory power with respect to behavior complexity. The behavior of teachers, for example, is a balance between their mindset beliefs, other motivational beliefs, and perceived contextual variables. This compromise leads to teachers whose mindsets overlap in their feedback on intelligence in the research. Thus, it is insufficient to judge an individual's mindset belief solely on the basis of the behavioral patterns discussed in the growth mindset framework. Furthermore, this study indicates the possibility that teachers who endorse a growth mindset and a fixed mindset are treated as two separate cases, who are not absolutely relative but rather are influenced by perceived contextual factors, which need to be considered in the analysis of their behavior. Recent empirical research has revealed that even for teachers who self-report the same mindset, their teaching behavior is observed quite differently because the influence comes from the local context (Zhang et al., 2020). This highlights the lack of consideration of cultural factors in the framework of growth mindset theory. This suggests that growth mindset theory mainly emphasizes individual beliefs while not fully accounting for perceived contextual influences. In addition to the influence of contextual factors, the findings also suggest that teachers' mindset beliefs are not always fully reflected in their teaching practices. The qualitative results further illuminate the reasons for this incongruence. Specifically, although teachers who self-identified as having a growth mindset tended to provide more growth-oriented feedback than did those who reported a fixed mindset did, the study provided empirical evidence that teachers from both groups frequently employed a mixed feedback approach in

classroom settings, challenging the common assumption that teachers' self-reported growth mindset beliefs seamlessly translate into corresponding teaching practices, and the study revealed that teachers often demonstrated a mixture of fixed and growth-oriented feedback in the classroom. These results reinforce prior research that highlights inconsistencies between teachers' expressed mindset beliefs and the teaching behaviors observed in classroom settings (Rissanen, 2019; Zhang et al., 2020; Zhang & He, 2024b). Consequently, the findings emphasize the significant influence of local contextual factors in determining how teachers' mindset beliefs translate into actual classroom practice.

In light of these findings, this study advocates for a broader conceptualization of the growth mindset framework—one that integrates a more diverse range of contextual influences to improve its explanatory power. Theoretical frameworks such as the teacher ecology model (Buehl & Beck's, 2014)) and the hypothesized model for the socialization of implicit theories of intelligence (Haimovitz & Dweck's, 2017)) offer valuable insights, emphasizing the impact of institutional, cultural, and systemic factors on teachers' practices and the enactment of their beliefs.

Additionally, since the binary categorization of growth and fixed mindsets may be reductive, especially in complex behavioral contexts, this study further proposes the integration of variables, including but not limited to individual cultural background and the impact of the school environment, particularly within the Chinese educational context where hierarchical teacher-student relationships, exam-oriented pressure, and parental involvement shape classroom practices in distinct ways. This is particularly evident in cultural values associated with long-term orientation, such as perseverance, delayed gratification, and self-cultivation through effort, which are deeply rooted in Confucian educational traditions and continue to shape teachers' pedagogical beliefs and expectations. These elements, often overlooked in conventional mindset analyses, could provide critical insights into how mindset

beliefs are actually applied in real-life educational settings. Moreover, such an in-depth investigation might also explain why the effects of a growth mindset on predicting positive academic achievement are sometimes ineffective or less evident in certain social environments, as noted in previous studies (Sun, 2021). This expanded framework aims to move beyond a simplified binary view and instead considers mindset beliefs as embedded within a broader sociocultural and institutional context. For example, a recent study by Zhang and He (2025) reported that perceived parental autonomy support significantly moderated the relationship between teachers' mindset beliefs and students' academic achievement.

Approaching growth mindset theory in this way not only strengthens its theoretical foundation but also enhances its relevance in designing more effective and context-sensitive educational strategies. This perspective aligns with the emphasis in educational psychology on understanding learning and behavior as inherently shaped by complex and dynamic contextual influences (Balsam & Tomie, 2014). To further contextualize these findings within the Chinese educational system, it is necessary to consider several distinct cultural and structural factors that may interact with mindset beliefs in complex ways. For instance, the high level of power distance embedded in teacher – student relationships often discourages student voice and feedback-seeking behaviors, which could weaken the positive effects of growth-mindset-oriented teaching. Similarly, the emphasis on examination results in Chinese classrooms often leads to a performance-focused teaching culture, even among teachers who personally endorse growth mindset principles. These cultural norms and institutional expectations may contribute to the observed inconsistency between teachers' reported beliefs and their classroom practices. In addition, China's New Curriculum Reform (initiated in 2001 under the Ministry of Education's Basic Education Curriculum Reform Outline) has explicitly emphasized strengthening teacher agency, fostering student-centered learning, and encouraging pedagogical innovation (Wang, 2022).

This study also identified several non-significant relationships that carry theoretical implications. Specifically, teachers' growth mindset was not significantly associated with certain dimensions of cultural orientation, such as individualism and motivation towards achievement and success, nor with specific aspects of perceived school climate, including collaboration and student relations. These findings suggest that not all contextual dimensions exert the same degree of influence on teachers' belief systems. For example, in collectivist cultural settings such as mainland China, individualistic values may have limited salience in shaping professional cognition, as interdependence and conformity to group norms are often prioritized over personal autonomy (Hofstede, 2001). Likewise, constructs such as collaboration and teacher-student rapport may be shaped more by structural constraints or institutional expectations than by personal belief systems. As such, these non-significant associations highlight the importance of distinguishing between culturally central versus peripheral contextual dimensions when examining teacher beliefs. This reinforces the view that growth mindset theory should be interpreted through a culturally grounded and dimension-specific lens.

5.3.3 Growth and Fixed Mindsets May Not Represent Opposing Ends of a Single Continuum

This study revealed that, in real-world teaching contexts, the behaviors associated with growth and fixed mindsets do not always present as clearly distinct or mutually exclusive categories, as posited by Dweck in 2006 (see Section 2.2.2). This challenges the earlier assertions that behaviors stemming from these mindsets should be diametrically opposed. Contextual factors have been found to moderate these behaviors, resulting in a spectrum rather than a polarization of growth and fixed mindset behaviors. For example, a high power distance may inhibit the ability-focused pedagogical behaviors typically associated with a growth mindset, pushing teachers toward more performance-focused

behaviors. Conversely, a long-term orientation might lead teachers with a fixed mindset to adopt more ability-focused pedagogies, reducing their tendency to engage in performance-focused behaviors. This nuanced interplay may account for the observed asymmetry in the impact of growth and a fixed mindset of teachers on student learning outcomes. For example, while teachers with a growth mindset may be positively linked to students' learning motivation, this does not necessarily mean that fixed mindset teachers are negatively associated with it.

Thus, this study challenges the validity of inferring individuals' mindset beliefs purely from observed behaviors and calls into question the conventional binary distinction between growth mindsets and fixed mindsets. This calls for an enhanced focus on how individuals interpret and cognitively process behaviors. This necessitates a thorough investigation into the cognitive mechanisms that influence the perception and interpretation of behaviors linked to different mindset orientations. Notably, few studies, such as that by Kroeper et al. (2022), have investigated the perceptions of teaching behaviors among students and teachers, even when both groups identify with a growth mindset. Understanding from a cognitive perspective is crucial, as it provides a more complete comprehension of how mindset beliefs are expressed not only through observable behaviors but also through the complex processes of perception, understanding, and internalization by individuals. This approach could further clarify the subjective experiences and interpretations that inform the expression and recognition of mindset beliefs in various contexts.

5.4 Practical Implications

5.4.1 Incongruence between Mindset Beliefs and Teaching Practice

In addition to perceived contextual factors, this study revealed an inconsistency between what teachers reported regarding their mindset beliefs and the practices observed in their classrooms. Classroom observations (refer to Section 4.4) suggest that, despite many

teachers with a growth mindset employing ability-focused pedagogies, they also integrate other methods, such as student-centered and performance-focused pedagogies. According to the interview results (Section 4.3), this could be explained by teachers being influenced by various motivation theories when their beliefs about intelligence are applied. Consequently, teachers might select pedagogies they believe will most effectively motivate students to exert greater effort in learning, leading to a blend of teaching strategies. The findings align with the Hypothesized Model for the Socialization of Implicit Theories of Intelligence (Dweck & Bempechat, 2017) (refer to Section 2.3), which posits that teachers' behaviors are guided by the theory they deem most motivating for students. Although some teachers self-report a growth mindset, they often exhibit behaviors indicative of a fixed mindset, such as frequently providing feedback that recognizes students' innate abilities because they believe that this acknowledgment contributes to student progress. Thus, this study suggests that the identified discrepancies between mindset beliefs and teaching pedagogies do not undermine the validity of growth mindset theory. Instead, they enhance the comprehension of its application in light of motivation theories and behavior activation; that is, growth mindset-aligned feedback behaviors are likely to be employed when teachers perceive them as most motivating for student effort. In relation to the local context, these incongruities between belief and behavior should be interpreted in light of the broader sociocultural context of Chinese education. Specifically, the deeply exam-oriented structure of the school system, which prioritizes high-stakes testing and academic performance as the primary markers of success, exerts substantial pressure on teachers to adopt performance-oriented teaching practices (Dello-Iacovo, 2009). Within such a system, even teachers who endorse growth mindset beliefs may find it pragmatically necessary to emphasize ability and outcomes to meet institutional demands and parental expectations. Moreover, the Confucian legacy embedded in Chinese classrooms reinforces hierarchical teacher-student power relations, in which teachers are expected to act

as authoritative knowledge transmitters rather than co-constructors of learning. These dynamics can limit the enactment of process-oriented feedback, particularly in contexts where student autonomy and dialogic pedagogy are less culturally normative. Additionally, the collectivist cultural orientation prevalent in Chinese society often leads to the prioritization of group harmony and conformity over individual expression (Hofstede, 2001), which may constrain teachers' willingness to depart from dominant norms, even when personal beliefs diverge.

Accordingly, this study proposes that research into the growth mindset should focus on discerning whether specific behaviors are directly instigated by growth mindset beliefs or are the result of interactions with other concurrent beliefs. Most previous research (see Section 2.3) has examined the impact of intelligence beliefs on learning outcomes, specifically within education. However, this body of work does not address the interactive or joint mechanisms between intelligence beliefs and other beliefs. This understanding is crucial in psychology research, as behaviors are rarely influenced by a single belief. Elucidating the activation mechanisms of belief theories, such as those proposed by Connors and Halligan (2022), is fundamental and paves the way for future investigations. With respect to growth mindset beliefs, a critical part of this exploration is to establish robust mechanisms to determine when and how these beliefs specifically elicit certain behaviors. This approach would greatly enhance the understanding of the intricate interplay when growth mindset principles intersect with other motivational theories or educational methods. By establishing clear criteria or indicators for behaviors triggered by a growth mindset, researchers could more accurately distinguish the influence of the growth mindset from other contributing factors. Achieving such clarity could both validate the impact of growth mindset interventions across diverse educational contexts and support their more context-sensitive application. This would enable educators and psychologists to tailor their strategies more

effectively and exploit the full potential of growth mindset principles. Moreover, comprehending how growth mindset beliefs activate behaviors in tandem with other beliefs could provide valuable insights into their synergistic effects, leading to more holistic and impactful educational practices that cater to the diverse needs and motivations of students.

In addition, although the quantitative analyses confirmed that contextual factors such as power distance, instructional innovation, and long-term orientation moderated the relationship between teachers' mindset beliefs and student outcomes, the qualitative data provided essential interpretive depth that complements these findings. Drawing on the ecological framework of teacher beliefs presented in Section 2.3, particularly Dweck and Bempechat's (2017) hypothesized model, the qualitative evidence revealed how teachers' mindset-aligned feedback behaviors are often filtered through external environmental constraints. For example, some teachers who self-identified as endorsing a growth mindset described feeling hesitant or conflicted about implementing process-focused feedback when operating within an exam-oriented school culture. This hesitancy was often grounded in concerns about school evaluation criteria and parental expectations, suggesting that mindset enactment is shaped not only by individual belief but also by institutional and cultural pressures.

Additionally, interviews and classroom observations revealed the subtle influence of peer norms and leadership messaging. Teachers frequently referred to "what other teachers usually do" or "how the headteacher expects us to act" as reasons for adapting their feedback styles. These remarks mirror findings from prior research highlighting the role of informal norms in shaping teaching behavior (Zhang & He, 2024b). In such cases, teachers were not merely constrained by formal policy but by the prevailing expectations embedded in the professional culture of their schools. For instance, one teacher remarked that although she personally valued praising effort, she felt compelled to offer ability-based praise to align with

what was regarded as standard practice within her department.

Furthermore, the qualitative data surfaced instances in which teachers who reported fixed mindset beliefs still demonstrated growth-mindset-consistent practices. This pattern suggests that feedback behaviors may be influenced by other motivational or cultural factors, such as long-term orientation or a sense of collective responsibility. These findings reinforce the argument made in Chapter 2 that mindset belief is rarely the sole determinant of behavior. Instead, it interacts dynamically with broader sociocultural and institutional factors, including educational policy, school leadership structure, and pedagogical norms (Zhang et al., 2020; Haimovitz & Dweck, 2017).

By triangulating these qualitative insights with the quantitative findings, the study demonstrates that the incongruence between self-reported mindset and observable feedback behavior is not simply a measurement issue, but a meaningful reflection of how belief systems are mediated through real-world conditions. This underscores the importance of adopting multi-level, context-sensitive approaches in future research and intervention design. Such approaches should not only seek to shape teacher beliefs but also modify the structural and cultural conditions under which those beliefs are enacted in classroom practice.

5.4.2 Response to the Failed Replication of Growth Mindset

Although exploring the relationship between a growth mindset and academic outcomes is beyond the scope of the present study, the findings offer a potential explanation for the consistent patterns based on the results of the present study. Specifically, several studies (Yeager et al., 2018; Li & Bates, 2019; Sun et al., 2021) have raised questions about the ability of growth mindset theory to predict academic outcomes, particularly its replicability in various contexts (see Section 2.5). This study adds to the ongoing discourse by demonstrating that behaviors commonly linked to a growth mindset may also be exhibited by teachers who endorse fixed mindset beliefs. These findings emphasize the pivotal role of

contextual factors in shaping the relationship between teachers' mindset beliefs and their teaching practices. Observations in classrooms (see Section 4.3) frequently revealed that students were encouraged by teachers, self-identified with a fixed mindset, to exert effort and pursue long-term goals and practices typically associated with a growth mindset. This suggests that the primary factor influencing student outcomes is teachers' teaching practices rather than their self-reported mindset belief, even though there is a discrepancy between teachers' teaching practices and their self-reported mindset belief. In light of the analysis results (Section 4.2.2) and interviews (Section 4.3), it is plausible that teachers' feedback is influenced by a moderating effect of their cultural orientation toward long-term thinking and mindset beliefs, although more empirical evidence is needed to support this. This insight potentially explains the failure of growth mindset theory to predict learning-related outcomes, which is particularly important since prior studies (see Section 2.5) have largely neglected the relationship between teachers' mindset beliefs and actual classroom practices, along with the potential moderating role of perceived contextual influences, with a focus instead of categorizing mindset beliefs on the basis of teachers' self-reports (Sisk et al., 2018; Bardach et al., 2024). Essentially, the inconsistencies in the literature regarding the replication of growth mindset theory may stem from a failure to adequately consider the complex interplay between teachers' self-reported mindset belief, classroom practices, and contextual moderating effects.

Furthermore, the discovery of a contextual moderating effect on growth mindset theory may suggest the likelihood of a "contextual override" in specific environments, although additional research is needed for confirmation. For example, in the current study sample, a teacher who self-reports a fixed mindset but is influenced by a long-term orientation regularly praises students for their efforts. In such cases, classroom observations might more likely lead to the assumption that this teacher possesses a growth mindset. Here,

the manifestation of the teacher's mindset belief is concealed by their long-term orientation, leading to a discrepancy between the teacher's declared fixed mindset and their actual teaching behavior. A recent study (Zhang & He, 2024b) reported similar findings, showing that teachers' growth mindset beliefs were not fully translated into growth-oriented feedback in real classroom settings. This discrepancy was attributed to the influence of the local school climate, which emphasized short-term academic achievement and thereby pressured teachers to adopt performance-oriented teaching practices. This scenario not only obscures the teacher's actual mindset beliefs but also hinders accurate evaluation of the growth mindset's effect on student learning outcomes, especially when relying solely on a single method of assessment. Simply put, while this study identified associations between self-reported mindset beliefs and contextual factors, the extent to which such factors may override or obscure teachers' actual beliefs in observable behavior remains insufficiently understood.

5.4.3 AT All, Consider the Value of a Growth Mindset, But Adapt It to Context

While this study shows that students generally perform better when taught by teachers with a growth mindset in some aspects of learning-related outcomes than when taught by teachers with a fixed mindset, it is critical to understand that a growth mindset is not a one-size-fits-all solution for educational challenges. The findings highlight that the perceived context serves as a moderator in the relationship between teachers' growth mindset and students' learning-related outcomes. This study posits that the application of growth mindset theory is highly context sensitive, contingent upon local culture and educational systems. This notion has been subtly indicated in the literature, but this study provides empirical evidence to support it. For example, in the United States, successful applications of growth mindset strategies have been linked to overcoming beliefs in fixed intelligence, resulting in increased student effort (Yeager et al., 2019). This implies that, in these cases, students may not have been exerting significant effort in learning previously. Similarly, in Finland, the

implementation of growth mindset teaching methods aligns with the educational system's inherent focus on fostering personal capabilities rather than current achievements. This approach encounters less resistance, largely due to supportive policies (Rissanen et al., 2019), highlighting the Finnish education system's inherent emphasis on personal development. This research argues that the growth mindset theory should not be seen as a cure-all that can be applied uniformly across different cultures or educational systems. Instead, the implementation of the framework should be contextually tailored, and the specific cultural and institutional mechanisms at play should be carefully considered.

In light of the present study's context, the findings enable the study to offer professional recommendations for various educational stakeholders, including educational local authorities, school administrators, teachers and students in Shanghai. These professional recommendations also shed light on the design of further growth mindset interventions in the local context.

- Growth mindset training. Research indicates a significant scarcity of growth mindset training for teachers in mainland China, despite the marked interest exhibited by teachers. The implementation of growth mindset training in school settings has emerged as a critical and multifaceted endeavor. This approach extends beyond simply introducing the concept of a growth mindset. As suggested by Buchanan (2024), a comprehensive understanding of the differences between fixed and growth mindsets, encompassing their psychological foundations, historical development, and the diverse global perspectives that influence these mindsets, is needed. Moreover, it is essential for school administrators and teachers not only to grasp these concepts but also to integrate them effectively into their daily teaching methodologies. This can be achieved through various strategies, including practical exercises, case studies, and role-playing scenarios, to enrich the learning experience

(Nalipay et al., 2021). Otherwise, in line with recent findings by Zhang and He (2024), the current lack of formal school-based growth mindset training leaves teachers with no choice but to engage in self-directed learning. This reliance on individual interpretation can lead to misunderstandings of the growth mindset concept and result in inconsistencies in its application within classroom practices, as also evidenced in the present study. Collectively, these findings highlight the importance of prioritizing the implementation of structured, school-based growth mindset training.

- Curriculum reform. Curriculum reform in middle schools, as indicated by the study, necessitates the urgent integration of growth mindset principles into the educational framework. This integration of a growth mindset aligns well with the current direction of China's educational policy, called China Education Modernization 2035, which advocates that local schools be granted flexibility in selecting learning materials and pedagogical methods, with the purpose of creating a positive learning environment. However, the study also reveals a significant challenge: teachers often face a paradox where schools endorse a growth mindset but also evaluate teaching effectiveness on the basis of examination scores, in line with recent findings by Zhang and He (2024). Thus, infusing a growth mindset into the curriculum is not straightforward. The process should encompass a comprehensive review and possible modifications of essential elements such as learning objectives, lesson plans, and evaluation methods to ensure alignment with the principles of a growth mindset. As noted by Rissanen et al. (2019), embedding growth mindset principles into classroom practice requires coherence across curriculum design, instructional delivery, and assessment strategies. This situation also calls for a nuanced approach to curriculum development that simultaneously promotes a growth mindset while

recognizing the prevailing emphasis on academic performance in the context of China's exam-oriented education system (Dello-Iacovo, 2009). Such curriculum adaptation can support teachers in navigating the inherent tension between fostering students' personal development and meeting institutional performance metrics, thereby cultivating a learning environment that values both mindset cultivation and academic excellence. Further research is warranted to refine and evaluate this balanced curricular model in practice.

- **Teacher evaluation.** This study revealed that teachers in mainland China generally exhibit high levels of long-term orientation, high power distance, and uncertainty avoidance. An essential observation is the alignment of high long-term orientation with the growth mindset principle of valuing effort-making; this finding aligns with those of previous research (Zhang & He, 2024a). Evidence of this alignment is found among both growth and fixed mindset teachers, as both groups emphasize encouraging students to make an effort in their classroom feedback. However, this also presents challenges, akin to what Dweck (2015) describes as a false or fake growth mindset. This phenomenon, characterized by an overemphasis on effort alone, leads to the neglect of strategies, external assistance, and learning from mistakes. Teachers with a fixed mindset in this study may fall into this trap, focusing excessively on the importance of effort owing to their long-term orientation but failing to offer effective strategies for exerting that effort. Thus, when designing growth mindset interventions for teachers, a clear distinction between a genuine growth mindset and a false growth mindset must be made. Additionally, the high power distance and uncertainty avoidance prevalent among mainland Chinese teachers suggest a relatively disadvantaged position in the school hierarchy, indicating a need for greater support from the school administration.

These findings suggest that professional development initiatives should extend beyond individual teacher growth to encompass the wider institutional environment in which teaching occurs. Support mechanisms, such as offering professional development opportunities and creating a supportive school culture, are crucial for empowering teachers and facilitating the effective implementation of a growth mindset in their teaching practices (Robinson & Bond, 2025). This comprehensive approach ensures that teachers are not only equipped with a mindset but also supported in a way that acknowledges and addresses the unique challenges they face within the educational system of mainland China.

- On the basis of the qualitative findings of this study, which reveal that teacher evaluations are predominantly based on student exam scores, such an evaluative standard appears excessively rigid and may unintentionally pressure teachers to adopt performance-driven instructional approaches—an approach that stands in contrast to the foundational ideals of a growth mindset (Dweck, 2006). Thus, in revising teacher evaluation methods, it is crucial to adopt a more holistic approach. This approach should extend beyond conventional metrics such as student performance and pedagogical expertise, pivoting toward an ability-focused pedagogy rather than a performance-focused pedagogy. This shift highlights the substantial impact that mindset has on effective teaching. It not only assesses traditional aspects of teaching but also highlights the critical importance of the teacher's role and instructional approach in fostering an optimal learning environment (Yeager et al., 2022). Furthermore, establishing an open feedback channel is essential. This would enable teachers to refine their teaching methods continuously on the basis of these evaluations, creating a teaching methodology that is dynamic and adaptable over time (Levin, 2008). This comprehensive strategy of

broadening assessment criteria and facilitating ongoing feedback contributes to a more inclusive and progressive system of teacher evaluation, promoting continuous growth and evolution in educational practices.

- Additionally, this study reveals that within the perceived school climate among teachers, there is a common occurrence of low resources, limited decision-making autonomy, and a lack of instructional innovation, and these factors have been identified as negatively moderating the relationship between teachers' growth mindset and students' learning-related outcomes. This finding is critical because it highlights the school climate constraints that teachers in mainland China face. The scarcity of school resources can impede the effective implementation of new teaching strategies aligned with a growth mindset. Limited decision-making power and a paucity of instructional innovation may hinder teachers' ability to apply creative and individualized approaches in their classrooms. A lack of instructional innovation further limits the adaptability of teaching to students' diverse needs, thereby weakening the potential of growth mindset strategies to positively influence student outcomes. These challenges emphasize the need for systemic changes within the educational framework. These constraints must be addressed through the enhancement of the availability of school resources, empowering teachers with greater decision-making authority, and fostering an environment that encourages instructional innovation. Recent research has reported that these factors can positively predict teachers' growth mindset (Zhang & He, 2024a). By doing so, teachers would be better equipped to adopt and integrate growth mindset principles effectively in their teaching practices. This requires not only individual efforts from teachers but also collective action and support from educational policymakers, school administrators, and the community.

In conclusion, importantly, simply introducing a growth mindset is not a cure for educational difficulties. As Yeager et al. (2020) noted, effectively fostering a growth mindset demands sustained efforts and needs to be contextualized appropriately. Adopting a fragmented approach is unlikely to produce the anticipated outcomes. Thus, a comprehensive strategy that involves students, parents, teachers, school administrators, and local educational authorities is essential. Such a comprehensive approach can foster an environment that supports the flourishing of a growth mindset, thereby facilitating the actualization of teachers' mindset beliefs into feedback in teaching practices that align with growth-oriented principles in the classroom, which in turn can positively influence students' learning-related outcomes.

5.5 Limitations and Recommendations for Future Research

Although this study contributes to understanding the relationships among teachers' mindset beliefs, their feedback practices, and students' learning-related outcomes, several limitations should be acknowledged. These limitations point to directions for more targeted and actionable future research that can bridge theory and practice in educational settings.

First, this study does not differentiate between subject disciplines when examining teachers' mindset beliefs. However, recent research (Laurell et al., 2015) has suggested that individuals' implicit beliefs about intelligence may vary across different academic disciplines. For example, subjects such as mathematics and physics are often perceived as requiring innate talent, leading teachers in these fields to be more susceptible to fixed mindset beliefs. Conversely, subjects such as language, arts, and humanities emphasize effort, creativity, and personal growth, which may make teachers in these areas more likely to adopt growth mindset beliefs. The lack of subject-specific analysis in this study may constrain the extent to which the findings can be generalized across academic disciplines. Future research should investigate how teachers' subject areas influence their mindset beliefs, feedback practices, and learning-related outcomes. Additionally, intervention programs targeting

teacher mindset development may benefit from subject-specific tailoring.

Second, while this study investigates whether cultural orientation and perceived school climate moderate the relationship between teachers' mindset beliefs and student outcomes, it does not examine whether these contextual factors also shape the consistency between teachers' mindset beliefs and their enacted feedback. Prior studies suggest that teachers' espoused beliefs do not always align with their classroom behaviors, possibly due to institutional constraints such as curriculum demands or administrative expectations (Zhang & He, 2024b). Future research should explore how specific elements of the school environment, such as administrative pressure, time constraints, or performance-oriented school culture, influence the enactment of mindset-aligned feedback, particularly among teachers with a fixed mindset. Classroom video analysis or ethnographic methods may help clarify these influences.

Third, the current study does not explore the mediating mechanisms that could explain how teachers' mindset beliefs translate into student learning outcomes. While the present findings suggest significant associations between teacher beliefs and student-level outcomes, the pathways through which these effects occur remain unclear. Future studies could apply structural equation modeling (SEM) or path analysis to test hypothesized causal sequences and to examine whether variables such as students' perceived learning autonomy, academic control, or emotional responses to feedback mediate these relationships. Moreover, given the interrelated nature of teachers' growth mindset, cultural orientation, perceived school climate, and students' psychological and behavioral outcomes, a unified modeling framework would allow for the investigation of direct, indirect, and interaction effects while controlling for potential confounding variables. Such an approach would enable a more comprehensive understanding of how individual and contextual variables jointly influence student development. In particular, applying multi-level SEM or hierarchical linear modeling

(HLM) would allow future studies to account for the nested data structure (e.g., students nested within teachers or schools), address potential group-level dependencies, and more accurately estimate contextual effects. This rationale has also been acknowledged in response to examiner comments and formally incorporated into the current section as a recommendation for future methodological improvement.

Fourth, the present study does not consider whether teachers' intended feedback aligns with students' interpretations. Students may misinterpret feedback meant to encourage effort as veiled criticism, especially in high-stakes or culturally constrained classroom contexts. Future research should incorporate student interviews or perception surveys to investigate how feedback is received, interpreted, and internalized. This line of inquiry is especially relevant in collectivist cultures where indirect communication is common.

Fifth, the cross-sectional design limits causal inference. Future studies should use longitudinal or experimental designs to examine how changes in teacher mindset beliefs and feedback behaviors evolve over time and how these changes influence students' learning-related outcomes. Longitudinal tracking could also help detect reciprocal influences, where student progress and engagement may reinforce or challenge teachers' belief systems.

Sixth, although the sample includes diverse teachers from a reform-oriented district, findings may not be fully generalizable to broader Chinese or international settings. Future research could adopt comparative cross-regional or cross-national designs to investigate how cultural norms, educational policies, and systemic structures moderate the effectiveness of mindset beliefs and feedback practices. Specifically, subgroup analyses focusing on dimensions such as power distance and uncertainty avoidance could uncover culture-specific pathways through which mindset beliefs operate. In addition, while this study adopted Hofstede's individual-level cultural dimensions to represent contextual variation, it is acknowledged that this model offers a relatively generalized view of culture (Hofstede,

2001). As Rissanen et al. (2019) emphasized, the application of growth mindset theory in educational settings is closely tied to localized pedagogical traditions and institutional contexts. Similarly, Zhang et al. (2020) argue that teachers' beliefs and practices are embedded in dynamic school climates, shaped by systemic expectations, curriculum mandates, and professional norms. Therefore, future research may benefit from integrating more dynamic frameworks that account for the interaction between individual values and institutional or discursive contexts, thereby capturing how cultural influences on teacher beliefs evolve over time and across settings.

Seventh, while this study focused on how teachers' beliefs and contextual factors shape their feedback practices, it did not directly examine the relationship between teachers' observed mindset feedback and students' learning-related outcomes. Investigating this potential link would require a research design that captures both teaching behaviors and student interpretations. Given that students may perceive the same feedback in varied ways depending on cultural background, prior experiences, or classroom dynamics, future studies are encouraged to adopt matched, multi-informant designs. These designs should incorporate both observational data and student-reported feedback to provide a more accurate understanding of how feedback is received and internalized. In addition, longitudinal methods could help reveal how students' responses to mindset feedback change over time and what long-term effects such feedback may have on their learning-related outcomes. Furthermore, future studies are encouraged to explore how students interpret and negotiate feedback within broader cultural and power dynamics embedded in classroom interactions. Recognizing that students are not merely passive recipients but active meaning-makers, especially in hierarchically structured educational systems, will offer a more nuanced understanding of how mindset beliefs operate in real-world contexts. This line of inquiry would benefit from participatory or dialogic research methods that center student voice in

culturally specific classroom environments.

Eighth, while this study focused on a single reform-oriented district, it did not compare teachers across districts with different cultural environments. Collecting data from multiple districts with distinct educational traditions or policy climates could indeed enhance understanding of how contextual variation shapes teacher beliefs and classroom practices. However, the study addressed cultural variation through a person-centered approach by measuring individual teachers' cultural orientations using Hofstede's individual-level value framework. This method captures within-district variability that may stem from personal upbringing, professional background, or generational experience, and avoids confounding effects caused by systemic policy differences between regions. Future research is encouraged to build on this approach by incorporating cross-regional or cross-cultural comparative designs. Such comparisons would provide a stronger basis for understanding how systemic and institutional factors moderate the translation of teacher mindsets into feedback practices and student outcomes.

Ninth, future research could consider conducting qualitative research before the quantitative phase to better inform the design of measurement instruments and ensure cultural and contextual fit. This approach would allow for a deeper understanding of local educational contexts and culture-specific constructs, which could enhance the validity and relevance of the instruments. By integrating exploratory qualitative methods early in the research process, researchers could gather richer insights into the educational environment, further aligning the instruments with the unique cultural and contextual factors that may influence the study's outcomes. Moreover, while many of the instruments used in the present study, such as the Growth Mindset Inventory (Dweck, Chui et al., 1995), the Cultural Values Scale (Hofstede et al., 2010), and the Learning Self-Efficacy Scale (Schwarzer et al., 1999), have been validated in Chinese educational settings, some measures, for example the Academic Motivation Scale

(Vallerand et al., 1992), have not yet undergone full-scale psychometric validation in local educational contexts. To address this, the present study employed standard cross-cultural adaptation procedures including translation, back-translation, expert review, and pilot testing. In addition, confirmatory factor analyses were conducted to examine the structural validity of all instruments using the current sample (Guay, 2015; Greco et al., 2022). While these procedures improve the contextual relevance of the instruments, they cannot fully substitute for formal cultural validation. Future studies are therefore encouraged to undertake comprehensive construct validation and measurement invariance testing within Chinese populations to enhance the interpretability and generalizability of these instruments.

Lastly, while this study primarily draws on teacher reports and researcher-coded feedback, it does not include student voices. Future studies should integrate student perspectives to triangulate data and provide a more holistic understanding of how growth mindset messages are transmitted and received in classrooms. Collecting student-reported perceptions of teacher feedback would not only validate the observational data but also guide the development of more student-sensitive pedagogical strategies.

In addition to these directions, future research should also build on the theoretical and practical contributions of the present study. One of the most significant contributions lies in its demonstration of how mindset beliefs are not isolated constructs but are embedded within multilayered sociocultural and institutional contexts. This includes both individual-level values such as long-term orientation and uncertainty avoidance, and school-level factors such as decision-making autonomy and instructional innovation. By unpacking these relationships, the study challenges the universal applicability of mindset theory and highlights the need for localized, culturally sensitive models. These insights not only refine existing theoretical frameworks in educational psychology but also offer a roadmap for designing more effective mindset-based interventions. For instance, future programs could integrate training on how to

reconcile mindset-consistent pedagogy with institutional pressures such as exam accountability, or develop school-wide climate interventions that foster conditions favorable to process-oriented feedback. Grounding such interventions in the complex realities of teaching practice and cultural context, as emphasized in this study, can help ensure their sustainable implementation and greater impact on student learning.

5.6 Summary

The primary contribution of the findings generated from this study is that they enhance the understanding of how contextual moderating effects influence the relationship between teachers' growth mindset and students' learning-related outcomes. The interplay of various contextual factors with teacher beliefs can significantly impact feedback guided by a growth mindset, thereby affecting student learning outcomes. However, the practical application of a growth mindset has limitations in the theoretical framework, notably its lack of consideration of contextual nuances. Future research should leverage the insights from this study to develop growth mindset training programs that are not only relevant but also localized, ensuring more effective implementation. This approach will help tailor growth mindset strategies to suit the specific environmental and cultural contexts in which they are applied, thereby optimizing their impact on educational practices and student development.

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Table 1*Classification of Teachers' Mindset-oriented Feedback in Classroom Teaching Practice*

Code/classification	(-) Entity feedback	(N) Neutral feedback	(+) Incremental feedback	Key consideration	Literature
TC/Teacher response to students' challenges	Comfort students, give up the challenge or move on to other relatively easy problems (e.g. If this challenge feels too difficult, it might be beyond your abilities.)	Giving statements or actions is not instructive (e.g., it is okay to experience difficulty.)	Encouraging students to take challenges is an opportunity to hone their abilities (e.g., what aspect of your ability do you think you have improved to cope with challenges to this obstacle?)	Incremental theorist sees challenges as an opportunity to improve and make up for shortcomings, while the entity theorist believes that challenges should be abandoned to tackle tasks that you feel you can handle	Delasandro, 2016; Dweck, 1999; Kroeper et al., 2022
TO/Teacher response to students' obstacles	In the face of difficulties, students are encouraged to give up because they are limited by their own natural ability and thus cannot overcome them (e.g., you should bypass or disregard the obstacle as it beyond your abilities.)	Giving statements or actions is not instructive (e.g., it is okay, Encountering obstacles is a common part of the process.)	Encouraging students to face difficulties, giving inspiring or constructive suggestions to overcome them (e.g. do you think you need put more efforts or change your learning strategy?)	Incremental theorist believes that obstacles can be overcome because of insufficient effort or questionable learning strategy. The entity theorist believes that innate abilities prevent him from overcoming obstacles	Blackwell et al., 2007; Dweck, 1999; Rissanen et al., 2019
TE/Teacher response to students' effort	whether the task is completed or not has nothing to do with efforts, but determined by natural ability, i.e., believing that students can not complete a task no matter how much effort they make (e.g., Effort won't matter if you're not smart enough.)	Neither affirming the value of effort nor denying the necessity of effort (e.g., that's ok, that is what you did)	To affirm the value of a student's hard work (e.g., your hard work will be rewarded; hard work is a necessary condition for success)	The attitude towards effort is the key indicator to distinguish between incremental theory and entity theory. Entity theory denies the value of effort because they believe that people's ability is constant and cannot be improved through effort	Kroeper et al., 2022; Rissanen et al., 2018a; 2019



CF/Type of criticism feedback	To criticise students' innate ability (e.g., you are not clever enough to handle this, you are slow, you are not intelligent)	Giving negative statements or actions is not instructive (e.g., this is not your best work, you could do better)	To criticise students for lack of effort or problems with effort strategies (e.g., your effort is not enough, you need to adjust your strategy)	Incremental theorist attributes failures to non-innate ability, so the next failure can be avoided through effort and strategy, while entity theorist attributes failures to innate ability, and learned helplessness follows failure	Kamins & Dweck, 1999; Kroeper et al., 2022
PF/Type of praise feedback	Praising students' natural abilities (e.g., you are so clever)	A statement or act of praise without attribution (e.g., you are good, you are better than before, well done)	Praising students for their efforts or strategic adjustments (e.g., your efforts are rewarded, your success comes from your efforts)	Incremental theorist values the effort put in after success, while the entity theorist believes that success depends on innate ability	Muller & Dweck, 1998; Kamins & Dweck, 1999
TS/Teacher response to success of others	Considering a certain students' success as a threat to others, e.g., his success is due to his higher intelligence level than you	Neither learn from others' success case nor see them as threats (e.g., ok, he did well, he was good)	Encouraging students to learn from others' successful cases (e.g., learn his effort made, lean his strategy)	Incremental theorist regards the success of others as its own learning material from which to gain experience of their success (e.g., putting in more effort and adopting appropriate learning strategies), while the entity theorist views the success of others as a threat, Because the success of others is the result of internal conditions better than oneself	Dweck, 1999; Kroeper et al., 2022



Table 2*Literature on Measuring Teachers' Implicit Intelligence Beliefs*

Authors and Year	Teacher Sample Size	Methods
Jones et al., 2012	237	Self-report
Gutshall, 2013	238	Self-report
Shim et al., 2013	209	Self-report
Laine et al., 2016	463	Self-report
Park et al., 2016	58	Self-report
Zeng et al., 2019	472	Self-report
Zeeb et al., 2020	59	Self-report
Snyder et al., 2021	163	Self-report
Lin et al., 2022	1297	Self-report
Yu et al., 2022	358	Self-report
Liu et al., 2023	486	Self-report
Lee et al., 2023	267	Self-report
Zhang & He, 2024a	811	Self-report

Table 3*Literature on Teachers' Growth Mindset Theory in Mainland China*

Study	Methods	Research Purpose or Contribution
Lin et al., (2022)	Questionnaire	It investigates the effects of leadership, teachers' growth mindset and self-efficacy in teachers' sustainable professional development
Zhang & Koshmanova (2021)	Interview	It explores the teachers' experiences of their professional performance from novice to expert
Chen et al., (2021)	Questionnaire	Improving the efficiency of learning and promoting achievements, exploring the correlation of the growth mindset to students and teachers
Zeng et al., (2019).	Questionnaire	It addresses the relation of teachers' growth mindset and work engagement
Zhao et al., (2018)	Questionnaire	It sheds light on the underlying mechanisms by which growth mindsets and grit positively influence education



Table 4*Six-phases of Thematic Analysis*

Phase stage	Guidance	Application in this study
Phase 1 Familiarizing yourself with your data	Transcribing oral expression into wiring, reading repeatably, looking for patterns	Transcribe interview, familiar with transaction and read it carefully and repeatedly, taking notes systemically
Phase 2 Generating initial codes	Organizing those data into meaningful groups, and creating codes in a deductive or inductive way	Using NVivo or manual wiring to capture word frequencies, compare those codes with predetermined codes, looking for the similarity or incongruence in all initial codes
Phase 3 Generating themes/Theme development	Categorizing all initial codes into potential themes, or sub-themes, or miscellaneous	Using minds maps/concept maps in NVivo to clarify the rationale in all codes, and arranging them in proper themes
Phase 4 Reviewing potential themes	Checking the correctness of themes, for example, codes is put in wrong theme, two sub-themes could be merged into one theme	Checking a theme has a central organizing concept, is there meaningful data to support a theme, is the theme related to the research questions
Phase 5 Defining and naming themes	No overlaps in themes, and name them	To ensure the data in each theme organize into a coherent, internally consistent narrative, to think how each theme is connected to the research questions, name each theme
Phase 6 Producing the report	Making a story of your data (presenting with clear, concise, logical and evidence based way), embedding them into your report	Present data with themes and details, showing rationale on how those themes are related to the research questions, using the result of thematic analysis for addressing the research questions



Table 5*Overview of Growth Mindset Inventory Results*

Intelligence Belief	Percentage	Numbers
Growth Mindset	47.72%	387
Mixed Mindset	20.34%	168
Fixed mindset	31.94%	256

Note. Total_n = 810.

Table 6*Descriptive Statistics and Correlations among Mindset Beliefs, Feedback Types, and Other Study Variables*

Variables	Mean (SD)	1	2	3	4	5	6	7
1. Age	29.77 (5.63)	-						
2. Gender	-	0.03	-					
3. TE	8.13 (3.63)	0.66***	-0.01	-				
4. Edu	16.53 (0.88)	0.02	0.02	-0.01	-			
5. MB	4.02 (1.71)	0.01	-0.02	0.01	-0.02	-		
6. GMF	12.63 (2.05)	0.03	0.01	-0.03	0.02	0.56***	-	
7. NMF	4.18 (1.51)	-0.01	-0.02	0.02	-0.01	0.02	0.05	-
8. FMF	8.77 (1.85)	0.02	0.02	0.01	0.01	-0.44***	-0.36***	0.04

Note. Teachers_n = 810. *** $p < 0.001$. TE = Teaching Experience, Edu = Educational Years, MB = Mindset Belief, GMF = Growth Mindset

Feedback, NMF = Neutral Mindset Feedback, FMF = Fixed Mindset Feedback



Table 7

Hierarchical Regression Results: Effects of Teachers' Self-Reported Mindset on Growth, Neutral, and Fixed Feedback

	Growth Mindset Feedback			Neutral Mindset Feedback			Fixed Mindset Feedback		
	β	<i>SE</i>	f^2	β	<i>SE</i>	f^2	β	<i>SE</i>	f^2
Model 1									
Age	0.00	0.01	0.00	−0.02	0.00	0.01	0.02	0.01	0.01
Gender	−0.02	0.12	0.00	−0.02	0.01	0.00	0.02	0.01	0.00
TE	0.01	0.03	0.01	0.01	0.00	0.01	0.02	0.02	0.00
Edu	−0.03	0.01	0.01	0.03	0.01	0.01	0.03	0.02	0.01
R^2	0.01			0.02			0.03		
$F(4, 806)$	1.12			1.23			1.31		
Model 2									
<i>Step 1</i>									
Age	0.00	0.01	0.00	−0.01	0.00	0.01	0.01	0.01	0.01
Gender	−0.01	0.12	0.00	−0.01	0.01	0.00	0.02	0.01	0.00
TE	0.01	0.03	0.01	0.01	0.00	0.01	0.01	0.01	0.00
Edu	−0.01	0.01	0.01	0.00	0.01	0.01	0.02	0.02	0.01
<i>Step 2</i>									
MB	0.49***	0.03	0.34	0.02	0.01	0.01	−0.31***	0.03	0.22
ΔR^2	0.11***			0.01			0.09***		
$\Delta F(5, 805)$	27.87***			1.17			19.15***		

Note. Teachers_n = 810. *** $p < 0.001$. TE = Teaching Experience, Edu = Educational Years, MB = Mindset Belief.



Table 8*Demographic Characteristics of Interviewed Teachers*

Group	Name (p)	Age	Gender	Educational background	Teaching years	School, grade, title and taught course
A	Alice	29	M	Bachelor	8	H, 1&2, Head teacher, Math
	Brittany	25	M	Bachelor	3	G, 2&3, Specialty teacher, Chemistry
	Catherine	35	F	Bachelor	5	K, 1&2, Specialty teacher, Math
	David	41	F	Bachelor	8	O, 2, Head teacher, Chinese
	Elizabeth	27	M	Bachelor	3	C, 1&2&3, Specialty teacher, Music
	Francesca	33	F	Bachelor	5	E, 3, Specialty teacher, Math
	Gabrielle	25	M	Bachelor	1	L, 1, Specialty teacher, Chinese
	Hannah	29	M	Master	5	I., 2, Specialty teacher, Math
	Isabella	36	M	Bachelor	10	P, 1&2, Specialty teacher, English
	Jacob	27	F	Bachelor	2	R, 2, Specialty teacher, Math
B	Katherine	35	M	Master	12	E, 1&2, Specialty teacher, History
	Laura	31	M	Bachelor	7	N, 2, Head teacher, Chinese
	Michael	25	M	Bachelor	2	A, 1, Head teacher, Math
	Nicole	30	M	Bachelor	6	Q, 1&2, Specialty teacher, English
	Owen	34	F	Bachelor	7	G, 1&2, Specialty teacher, Geography
	Patrick	39	F	Bachelor	11	B, 2&3, Head teacher, Chemistry
	Quinn	39	M	Master	15	M, 1&2&3, Specialty teacher, Policy
	Rachel	25	M	Bachelor	2	D, 1, Specialty teacher, Chinese
	Steven	45	F	Bachelor	21	S, 2&3, Specialty teacher, Biology
	Thomas	37	M	Master	12	F, 2&3, Head teacher, English

Notes. Group A = self-reported growth mindset group (Growth Mindset Inventory score = 6), Group B = self-reported fixed mindset group (Growth Mindset Inventory score = 2).

Table 9*Descriptive Statistics, Reliability Estimates, and Intercorrelations of Mindset Beliefs, Cultural Orientation, and Perceived School Climate*

Variables	Mean (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Age	29.7 (5.63)	-														
2. Gender	-	0.02	-													
3. TE	4.55 (1.79)	0.76***	0.01	-												
4. Edu	17.14 (1.31)	0.02	0.00	0.00	-											
5. MB	4.12 (1.08)	0.02	0.00	0.01	-0.02	(0.81)										
6. PD	4.09 (1.68)	0.01	0.00	-0.02	0.01	-	(0.83)									
7. UA	4.05 (1.53)	0.01	-0.00	-0.01	0.03	-	0.23**	(0.81)								
8. ID	1.98 (0.51)	0.01	0.01	-0.01	0.02	0.02	0.03	0.02	(0.79)							
9. MO	1.43 (0.45)	-0.01	-0.01	0.03	0.01	0.02	0.02	-0.02	0.03	(0.75)						
10. LT	4.57 (1.53)	0.03	-0.02	0.02	0.02	0.58***	0.03	-0.04	0.02	0.02	(0.82)					
11. CO	3.44 (1.34)	0.02	-0.02	-0.01	-0.02	0.03	0.03	-0.00	0.03	0.02	0.02	(0.83)				
12. SR	3.61 (1.41)	0.02	0.02	0.02	-0.00	0.04	-0.02	0.03	0.00	-0.01	0.03	-0.03	(0.76)			
13. SRE	2.15 (0.72)	-0.02	0.02	0.01	0.02	0.24**	0.03	-0.02	0.01	-0.02	0.03	-0.02	0.01	(0.75)		
14. DM	2.06 (0.48)	-0.03	0.00	-0.01	0.04	0.51***	0.01	-0.03	-0.02	-0.03	0.02	0.01	-0.03	0.02	(0.81)	
15. II	2.13 (0.46)	0.02	-0.00	0.02	0.02	0.52***	-0.13	0.02	0.02	0.02	0.02	0.03	-0.02	0.03	0.02	(0.79)

Note. Teachers_n = 810. The diagonal values in parentheses represent the alpha-reliability coefficients. ** $p < 0.01$, *** $p < 0.001$. TE = Teaching Experience, Edu = Educational Years, MB = Mindset Belief, PD = Power Distance, UA = Uncertainty Avoidance, ID = Individualism, MO = Motivation towards achievement and success, LT = long-term Orientation, CO = Collaboration, SR = Student Relations, SRE = School Resources, DM = Decision Making, II = Instructional Innovation.

Table 10*Hierarchical Regression Results: Influence of Cultural Orientation on Teachers' Mindset Beliefs*

	β	<i>SE</i>	f^2
Model 1			
Age	0.04	0.03	0.02
Gender	0.03	0.02	0.02
TE	0.03	0.02	0.01
Edu	-0.02	0.01	0.01
R^2	0.01		
$F(4, 805)$	2.02		
Model 2			
<i>Step 1</i>			
Age	0.02	0.02	0.02
Gender	0.02	0.01	0.00
TE	0.02	0.01	0.01
Edu	-0.01	0.01	0.01
<i>Step 2</i>			
CO	0.02	0.02	0.02
SR	0.03	0.03	0.02
SRE	0.09**	0.03	0.06
DC	0.24***	0.07	0.21
II	0.25***	0.07	0.22
ΔR^2	0.11***		
$\Delta F(5, 799)$	28.34***		
Model 3			
<i>Step 1</i>			
Age	0.01	0.01	0.01
Gender	0.01	0.01	0.00
TE	0.01	0.01	0.00
Edu	-0.01	0.01	0.01
<i>Step 2</i>			
CO	0.02	0.01	0.01
SR	0.02	0.02	0.01
SRE	0.05**	0.02	0.03
DC	0.20***	0.04	0.17
II	0.21***	0.05	0.17
<i>Step 3</i>			
PD	-0.26***	0.08	0.24
UA	-0.21***	0.05	0.18
ID	0.03	0.01	0.01
MO	0.04	0.02	0.01
LT	0.27***	0.09	0.24
ΔR^2	0.13***		
$\Delta F(5, 794)$	34.16***		

Note. Teachers_n = 810. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. TE = Teaching Experience, Edu = Educational Years,

MB = Mindset Belief, CO = Collaboration, SR = Student Relations, SRE = School Resources, DC = Decision

Making, II = Instructional Innovation, PD = Power Distance, UA = Uncertainty Avoidance, ID = Individualism,

MO = Motivation towards achievement and success, LT = long-term Orientation.

Table 11*Hierarchical Regression Results: Influence of Perceived School Climate on Teachers' Mindset Beliefs*

	β	<i>SE</i>	f^2
Model 1			
Age	0.04	0.01	0.02
Gender	0.03	0.02	0.02
TE	-0.02	0.01	0.01
Edu	0.03	0.01	0.01
R^2	0.01		
$F(4, 805)$	2.02		
Model 2			
<i>Step 1</i>			
Age	0.03	0.01	0.00
Gender	0.03	0.02	0.00
TE	-0.02	0.01	0.01
Edu	0.02	0.01	0.01
<i>Step 2</i>			
PD	-0.26***	0.08	0.13
UA	-0.23***	0.07	0.11
ID	0.02	0.02	0.00
MO	0.02	0.02	0.01
LT	0.27***	0.08	0.14
ΔR^2	0.13**		
$\Delta F(5, 799)$	33.34***		
Model 3			
<i>Step 1</i>			
Age	0.02	0.01	0.00
Gender	0.02	0.01	0.00
TE	-0.01	0.01	0.00
Edu	0.01	0.01	0.01
<i>Step 2</i>			
PD	-0.21***	0.05	0.09
UA	-0.17***	0.04	0.07
ID	0.01	0.01	0.00
MO	0.01	0.01	0.00
LT	0.22***	0.06	0.10
<i>Step 3</i>			
CO	0.01	0.02	0.01
SR	0.02	0.05	0.01
SRE	0.08*	0.03	0.05
DM	0.24***	0.03	0.12
II	0.25***	0.03	0.12
ΔR^2	0.11***		
$\Delta F(5, 794)$	29.51***		

Note. Teachers_n = 810. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. TE = Teaching Experience, Edu = Educational Years, MB = Mindset Belief, CO = Collaboration, SR = Student Relations, SRE = School Resources, DM = Decision Making, II = Instructional Innovation, PD = Power Distance, UA = Uncertainty Avoidance, ID = Individualism, MO = Motivation towards achievement and success, LT = long-term Orientation.

Table 12

Descriptive statistics, reliability estimates and intercorrelations of study variables including mindset belief, cultural orientation, perceived school climate and learning-related outcomes

Variables	Mean (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Age	29.7 (5.63)	-																		
2. Gender	-	0.02	-																	
3. TE	4.55 (1.79)	0.76***	0.01	-																
4. Edu	17.14 (1.31)	0.02	0.00	0.00	-															
5. MB	4.12 (1.08)	0.02	0.00	0.01	-0.02	(0.81)														
6. PD	4.09 (1.68)	0.01	0.00	-0.02	0.01	-0.54***	(0.83)													
7. UA	4.05 (1.53)	0.01	-0.00	-0.01	0.03	-0.46***	0.23**	(0.81)												
8. ID	1.98 (0.51)	0.01	0.01	-0.01	0.02	0.02	0.03	0.02	(0.79)											
9. MO	1.43 (0.45)	-0.01	-0.01	0.03	0.01	0.02	0.02	-0.02	0.03	(0.75)										
10. LT	4.57 (1.53)	0.03	-0.02	0.02	0.02	0.58***	0.03	-0.04	0.02	0.02	(0.82)									
11. CO	3.44 (1.34)	0.02	-0.02	-0.01	-0.02	0.03	0.03	-0.00	0.03	0.02	0.02	(0.83)								
12. SR	3.61 (1.41)	0.02	0.02	0.02	-0.00	0.04	-0.02	0.03	0.00	-0.01	0.03	-0.03	(0.76)							
13. SRE	2.15 (0.72)	-0.02	0.02	0.01	0.02	0.24**	0.03	-0.02	0.01	-0.02	0.03	-0.02	0.01	(0.75)						
14. DM	2.06 (0.48)	-0.03	0.00	-0.01	0.04	0.51***	0.01	-0.03	-0.02	-0.03	0.02	0.01	-0.03	0.02	(0.81)					
15. II	2.13 (0.46)	0.02	-0.00	0.02	0.02	0.52***	-0.13	0.02	0.02	0.02	0.02	0.03	-0.02	0.03	0.02	(0.79)				
16. LM	5.63 (1.17)	0.02	-0.00	-0.01	-0.01	0.47***	-0.45***	-0.41***	-0.03	0.01	0.41***	0.03	0.01	0.35**	0.35**	0.36**	(0.82)			
17. LSE	3.87 (1.41)	0.02	0.02	0.01	0.02	0.51***	-0.47***	-0.40***	0.02	0.03	0.42***	0.02	0.03	0.38**	0.33**	0.34**	0.02	(0.81)		
18. LH	3.73 (1.22)	0.03	0.00	-0.00	0.02	-0.52***	0.44***	0.43***	0.01	-0.02	-0.43***	-0.02	0.02	-0.38**	-0.37**	-0.40***	0.01	0.01	(0.77)	
19. LE	3.92 (1.48)	0.02	-0.02	-0.02	-0.03	0.53***	-0.45***	-0.43***	0.02	0.02	0.44***	0.01	0.01	0.32**	0.33**	0.35**	0.03	0.02	0.02	(0.81)

Note. Teachers_n = 810. The diagonal values in parentheses represent the alpha-reliability coefficients. ** $p < 0.01$, *** $p < 0.001$.

TE = Teaching Experience, Edu = Educational Years, MB = Mindset Belief, PD = Power Distance, UA = Uncertainty Avoidance, ID = Individualism, MO = Motivation towards achievement and success, LT = long-term Orientation,

CO = Collaboration, SR = Student Relations, SRE = School Resources, DM = Decision Making, II = Instructional Innovation, LM = Learning Motivation, LSE = Learning Self-Efficacy, LH = Learned Helplessness, LE = Learning

Engagement.



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Table 13

Hierarchical Regression Results: Moderating Effects of Cultural Orientation on the Relationship between Teachers' Mindset Beliefs and Students' Learning-Related Outcomes

Independent Variables	Learning Motivation			Learning Self-Efficacy			Learned Helplessness			Learning Engagement		
	M1	M2	M3	M1	M2	M3	M1	M2	M3	M1	M2	M3
<i>Step 1</i>												
Age	0.02			0.05			0.02			0.02		
Gender	0.03			0.02			0.01			0.03		
TE	0.01			0.02			0.02			0.02		
Edu	0.02			0.04			0.03			0.01		
<i>Step 2</i>												
MB		0.20**	0.20**		0.23**	0.23**		-0.24**	-0.24**		0.25**	0.25**
<i>Step 3</i>												
1. MB × PD			-0.20**			-0.21**			-0.20**			-0.20**
2. MB × UA			-0.18**			-0.18**			-0.17**			-0.16**
3. MB × CO			0.05			0.07			0.05			0.05
4. MB × MO			0.07			0.06			0.05			0.06
5. MB × LT			0.21**			0.22**			0.22**			0.23**
<i>F</i>		32.03***	53.92***		37.21***	58.61***		40.20***	60.12***		45.81***	68.31***
<i>R</i> ²		0.09**	0.21**		0.12**	0.25**		0.13**	0.24**		0.14**	0.27**
ΔR^2		0.06**	0.12**		0.09**	0.13**		0.10**	0.11**		0.11**	0.13**

Note. Teachers_n = 810. The diagonal values in parentheses represent the alpha-reliability coefficients. ** $p < 0.01$, *** $p < 0.001$.

TE = Teaching Experience, Edu = Educational Years, MB = Mindset Belief, PD = Power Distance, UA = Uncertainty Avoidance, ID =

Individualism, MO = Motivation towards achievement and success, LT = long-term Orientation.



Table 14

Hierarchical Regression Results: Moderating Effects of Perceived School Climate on the Relationship Between Teachers' Mindset Beliefs and Students' Learning-Related Outcomes

Independent Variables	Learning Motivation			Learning Self-Efficacy			Learned Helplessness			Learning Engagement		
	M1	M2	M3	M1	M2	M3	M1	M2	M3	M1	M2	M3
<i>Step 1</i>												
Age	0.02			0.05			0.02			0.02		
Gender	0.03			0.02			0.01			0.03		
TE	0.07			0.02			0.02			0.05		
Edu	0.02			0.04			0.05			0.01		
<i>Step 2</i>												
MB		0.20**	0.20**		0.23**	0.23**		-0.24**	-0.24**		0.25**	0.25**
<i>Step 3</i>												
1. MB × CO			0.02			0.02			0.02			0.01
2. MB × SR			0.03			0.03			0.01			0.02
3. MB × SRE			0.19**			0.23**			0.20**			0.15**
4. MB × DM			0.19**			0.16**			0.18**			0.15**
5. MB × II			0.20**			0.17**			0.21**			0.17**
<i>F</i>		32.03***	48.15***		37.21***	50.13***		40.20***	53.51***		45.81***	65.21***
<i>R</i> ²		0.09**	0.19**		0.12**	0.24**		0.13**	0.21**		0.14**	0.25**
ΔR^2		0.06**	0.10**		0.09**	0.11**		0.10**	0.09**		0.11**	0.11**

Note. Teachers_n = 810. The diagonal values in parentheses represent the alpha-reliability coefficients. ** $p < 0.01$, *** $p < 0.001$.

TE = Teaching Experience, Edu = Educational Years, MB = Mindset Belief, CO = Collaboration, SR = Student Relations, SRE = School

Resources, DM = Decision Making, II = Instructional Innovation.

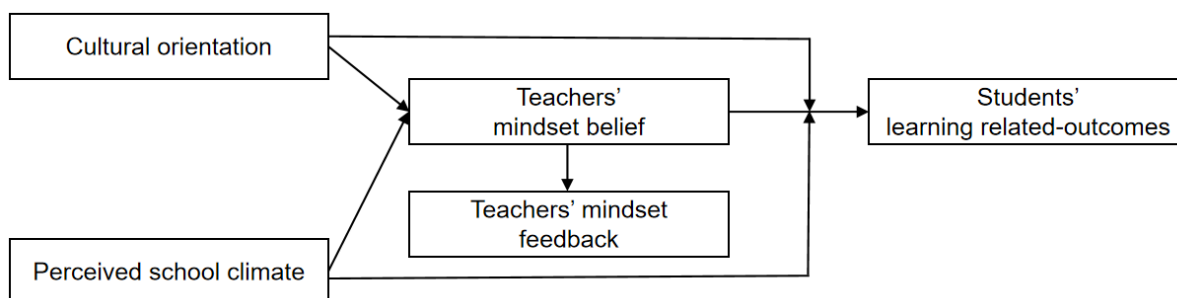
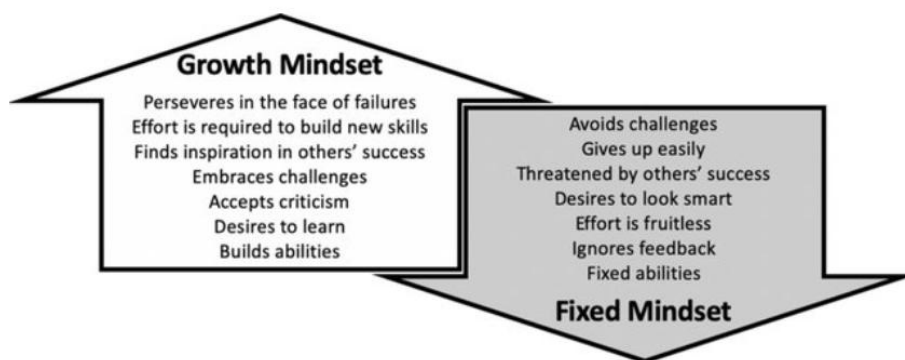
Figure 1*Conceptual Framework of the Present Study*

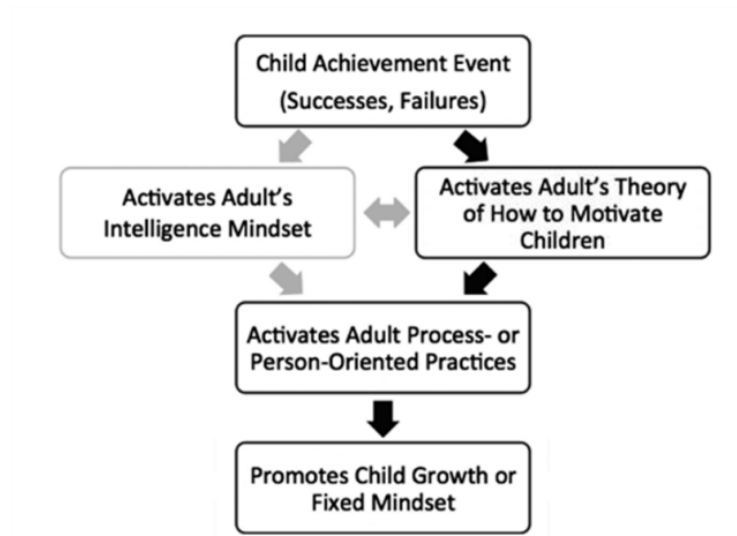
Figure 2*Carol Dweck's Theory of Growth Mindset*

Note. Reprinted from “A Practical Guide to Neuro-Oncology Fellowship,” by L. N. Gonzalez Castro, D. A. Forst, S. R. Plotkin, & E. Q. Lee, 2022, *Journal of Neuro-Oncology*, 1–7.

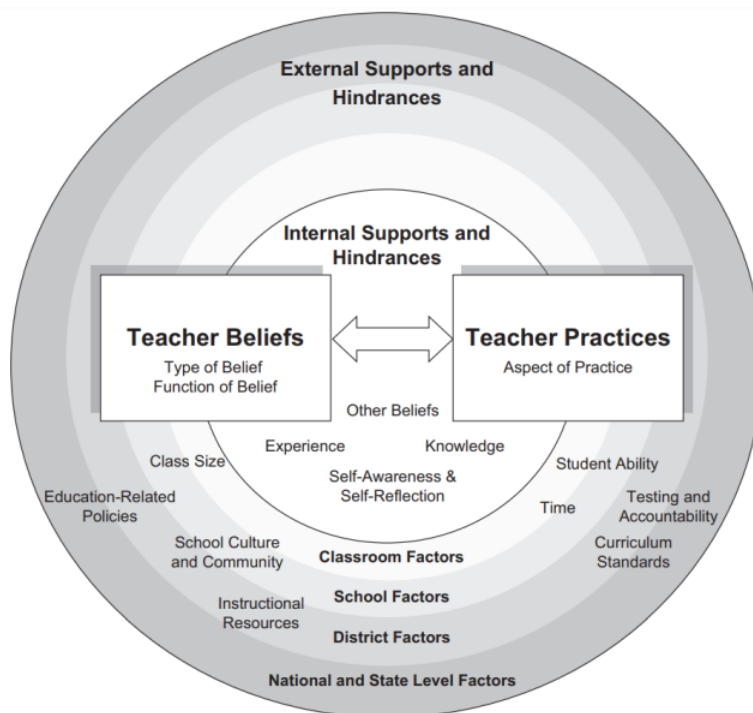
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Figure 3

Hypothesized Model for the Socialisation of Implicit Theories of Intelligence



Note. Reprinted from “The Origins of Children’s Growth and Fixed Mindsets: New Research and a New Proposal,” by K. Haimovitz & C. S. Dweck, 2017, *Child Development*, 88, 1849–1859. Copyright 2017 by the Society for Research in Child Development. Reprinted under fair use for academic purposes.

Figure 4*Teacher Ecology Model*

Note. Reprinted from “The Relationship Between Teachers’ Beliefs and Teacher Practices,” by M. M. Buehl & J. S. Beck, 2014, in H. Fives & M. G. Gill (Eds.), *International Handbook of Research on Teachers’ Beliefs* (pp. 66–84), Routledge. Copyright 2014 by Routledge. Reprinted under fair use for academic purposes.

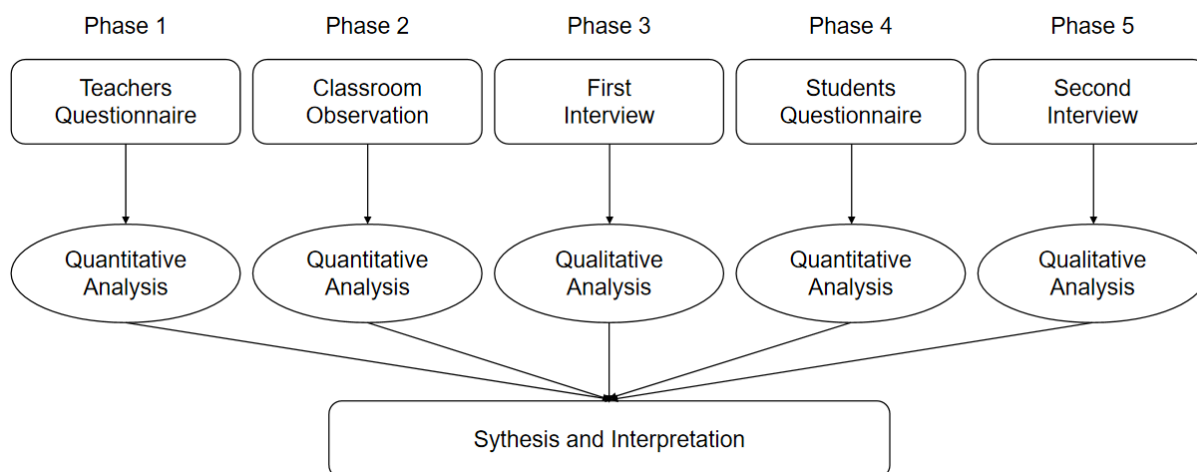
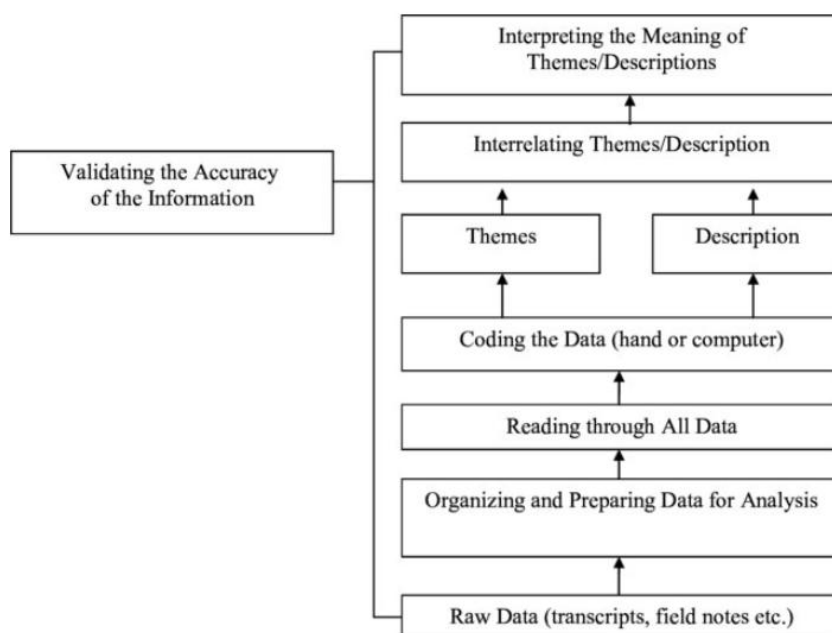
Figure 5*Data Collection Procedure and Data Analysis*

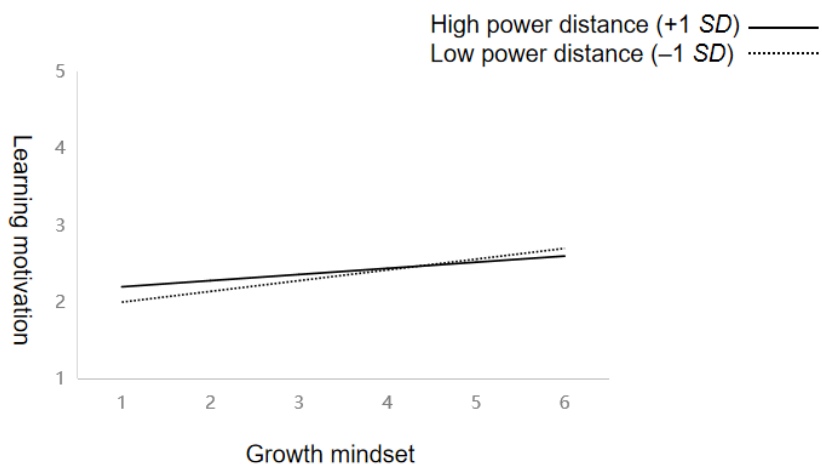
Figure 6*Creswell's Qualitative Data Analysis Framework*

Note. Reprinted from “Investigating Purpose and Impact of Professional Development in Response to Shifting Curriculum,” by M. Nawawi, J. Nurkamto, and Sumardi, 2018, *International Journal of Social Sciences & Educational Studies*, 5, pp. 86–97. Copyright 2018 by the International Journal of Social Sciences & Educational Studies. Licensed under CC BY-NC 4.0 (<https://creativecommons.org/licenses/by-nc/4.0/>).

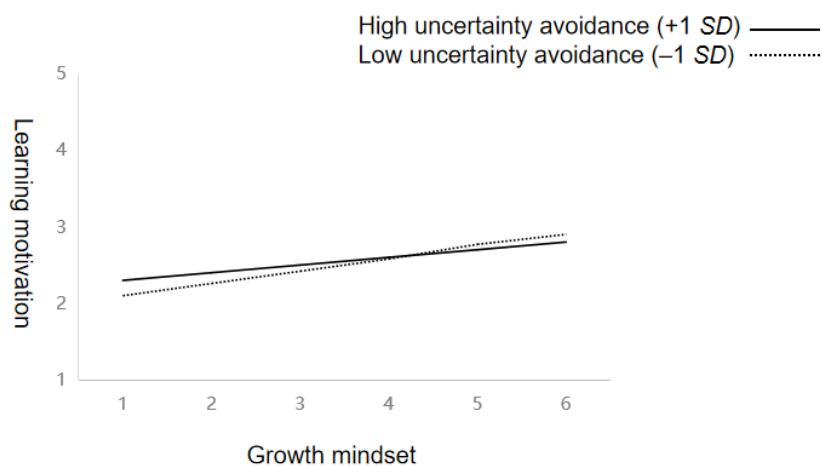
Figure 7

Power Distance (Panel A), Uncertainty Avoidance (Panel B), Long-Term Orientation (Panel C), School Resources (Panel D) and Decision Making (Panel E) and Instructional Innovation (Panel F) Moderated the Relation Between Teachers' Growth Mindset and Students' Learning Motivation

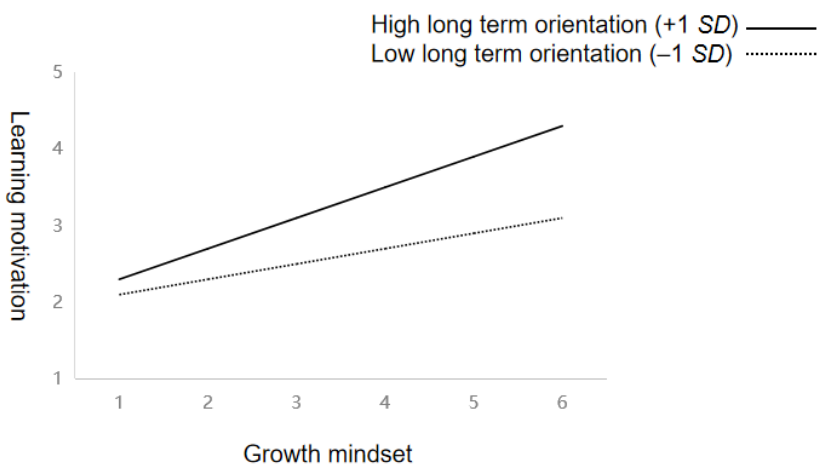
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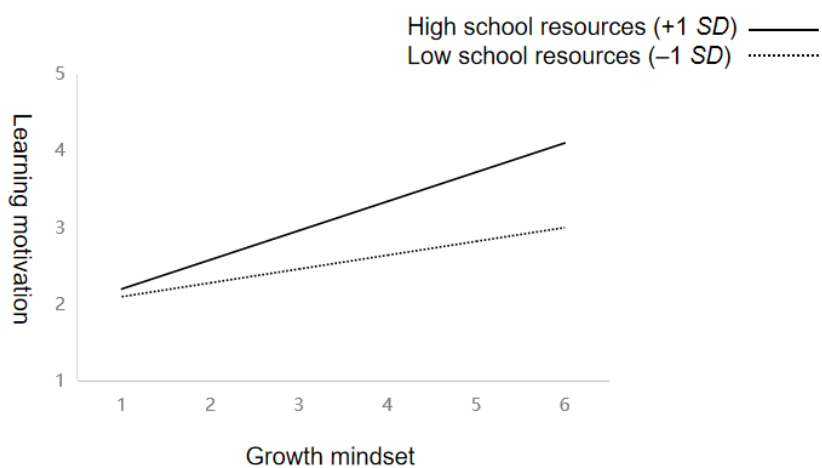
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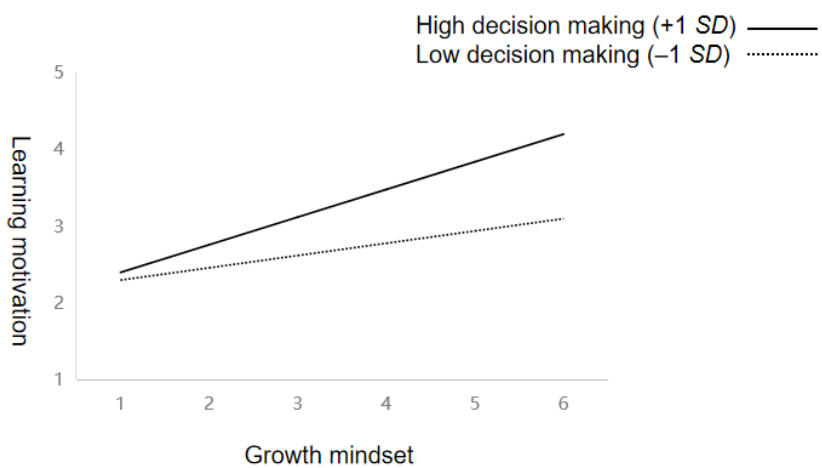
Panel C



Panel D



Panel E



Panel F

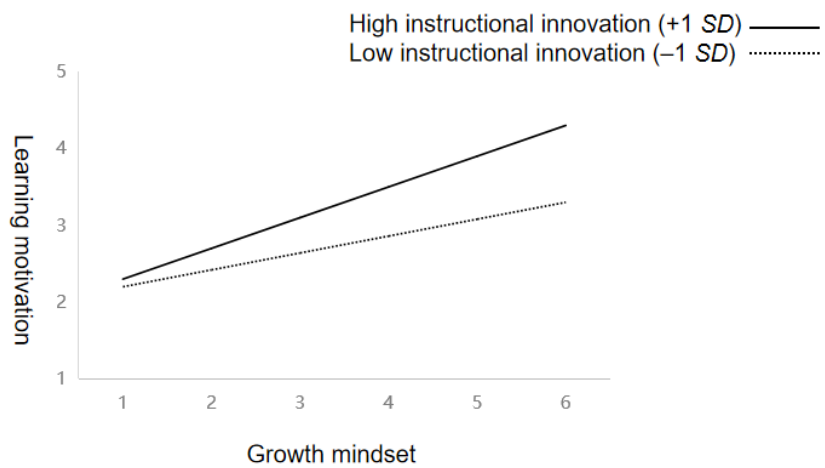
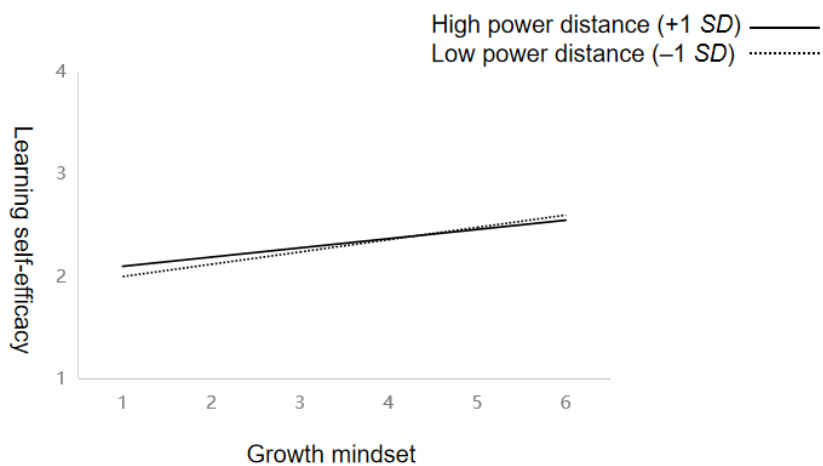


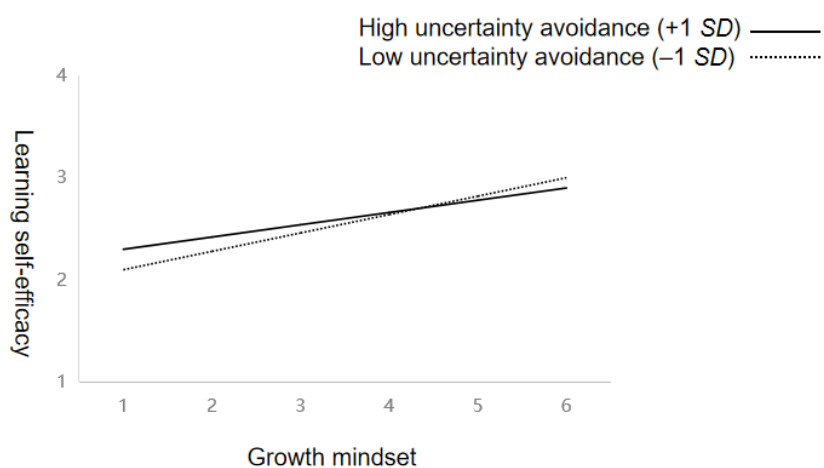
Figure 8

Power Distance (Panel A), Uncertainty Avoidance (Panel B), Long-Term Orientation (Panel C), School Resources (Panel D) and Decision Making (Panel E) and Instructional Innovation (Panel F) Moderated the Relation between Teachers' Growth Mindset and Students' Learning Self-Efficacy

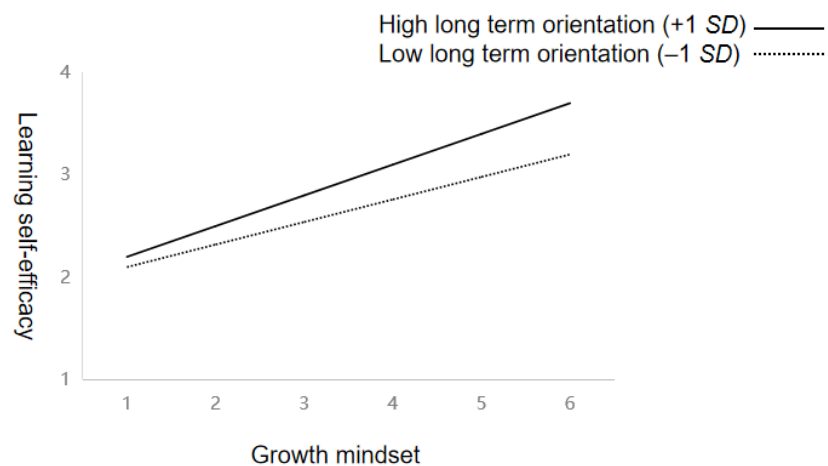
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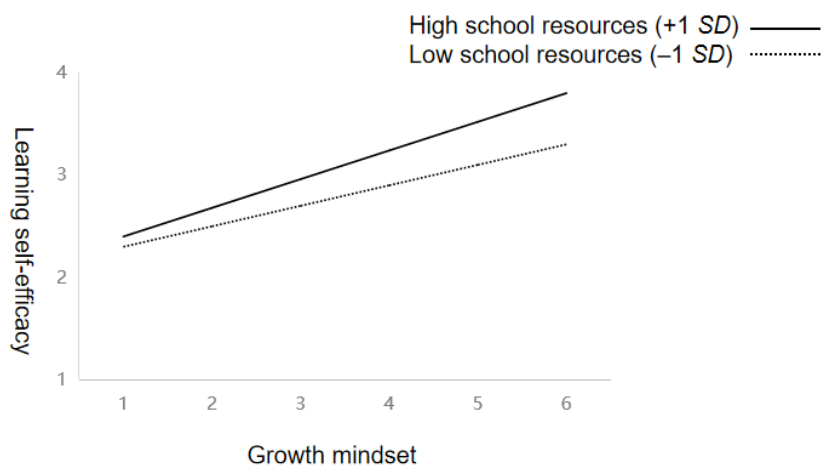
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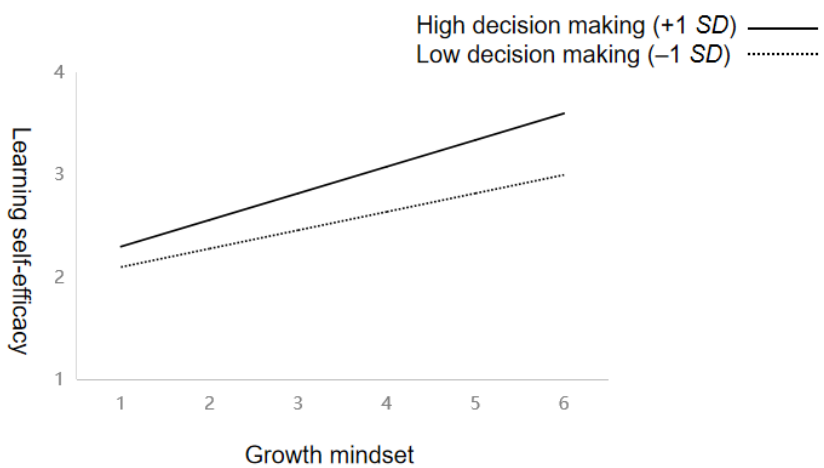
Panel C



Panel D



Panel E



Panel F

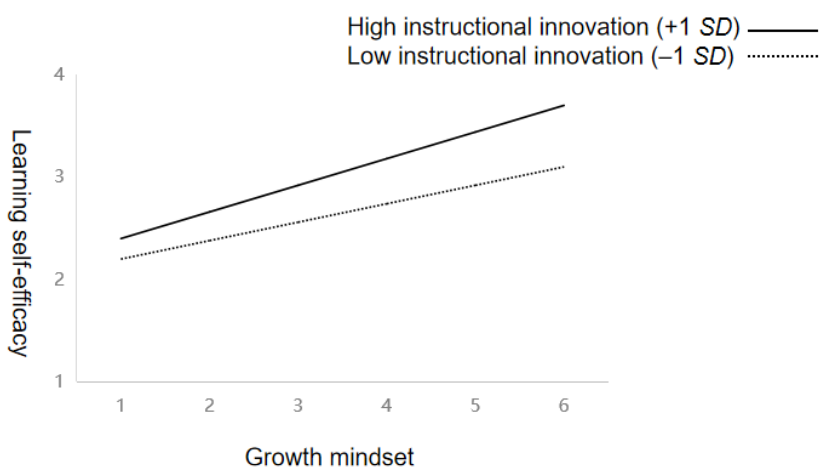
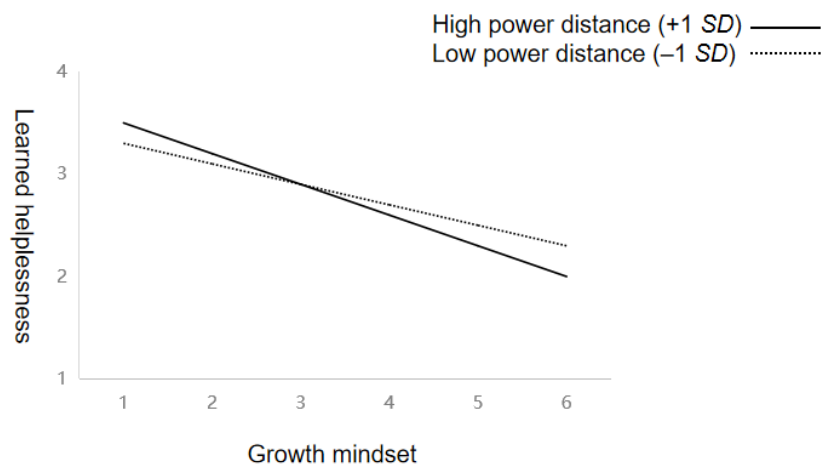


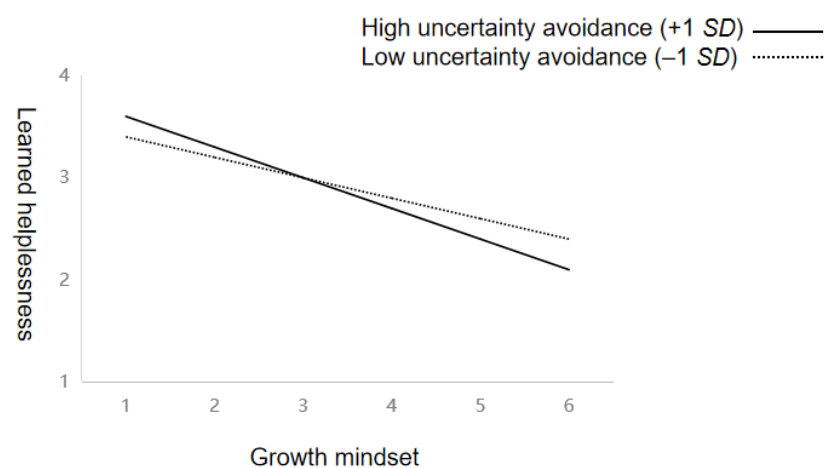
Figure 9

Power Distance (Panel A), Uncertainty Avoidance (Panel B), Long-Term Orientation (Panel C), School Resources (Panel D) and Decision Making (Panel E) and Instructional Innovation (Panel F) Moderated the Relation between Teachers' Growth Mindset and Students' Learned Helplessness

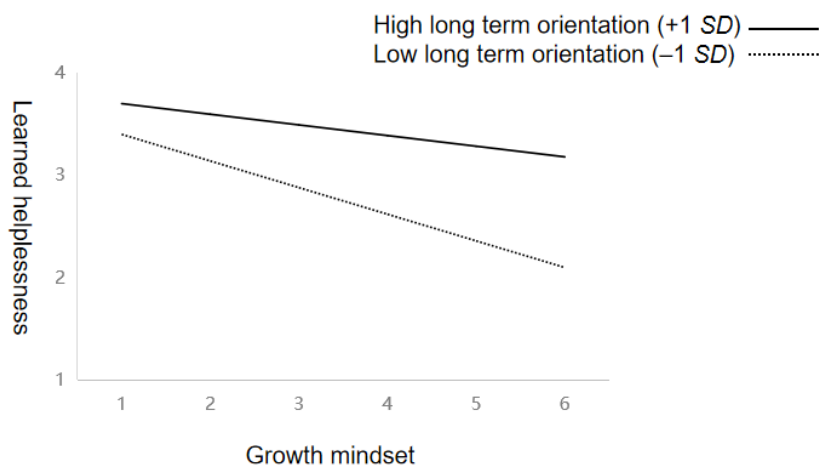
Panel A



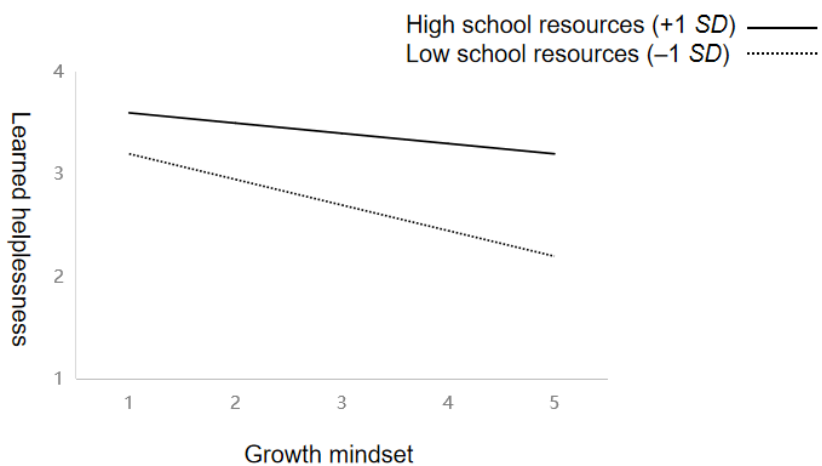
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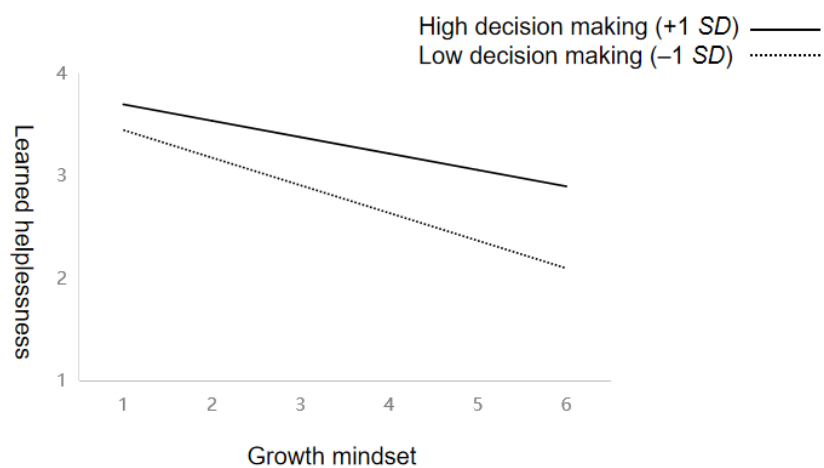
Panel C



Panel D



Panel E



Panel F

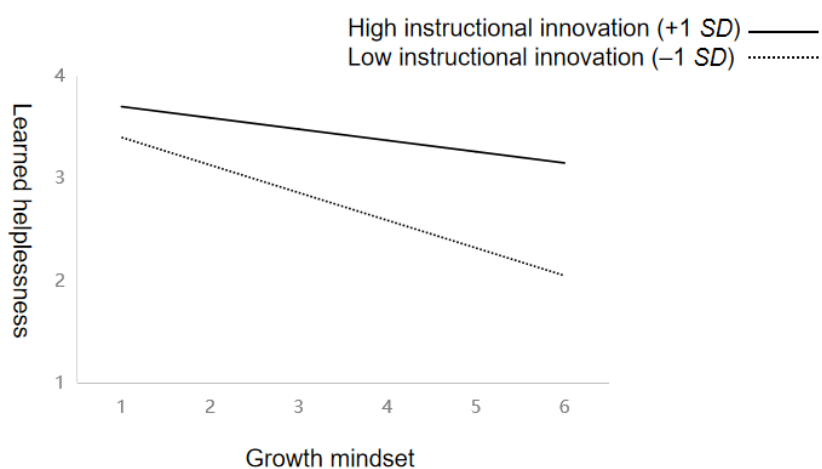
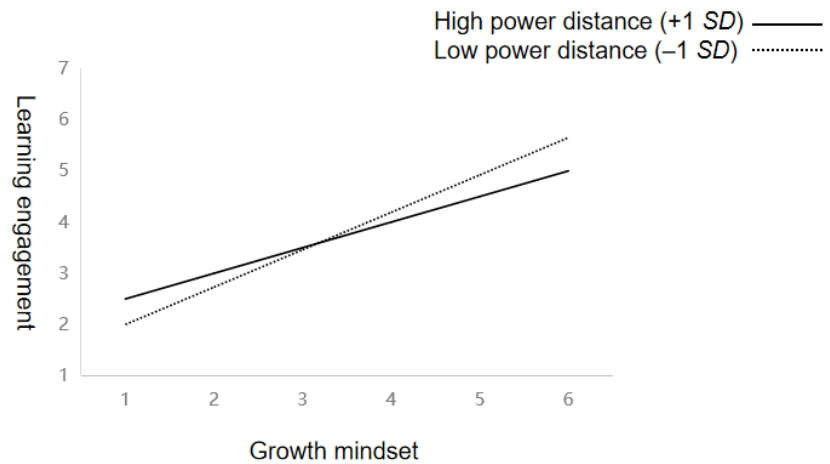


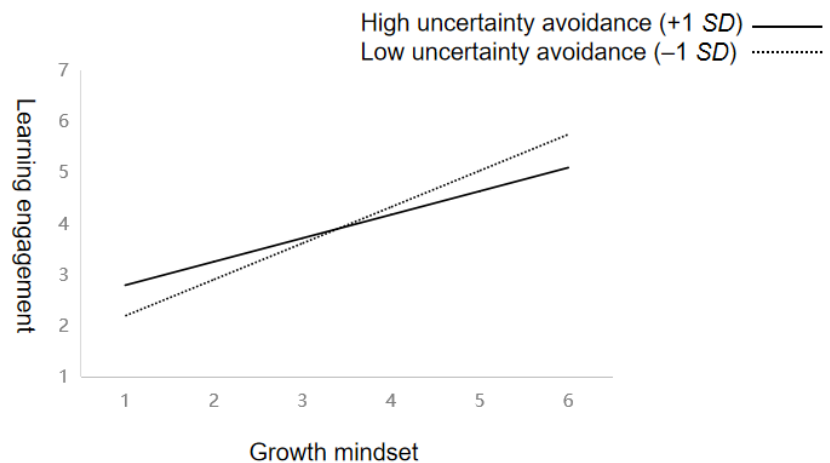
Figure 10

Power Distance (Panel A), Uncertainty Avoidance (Panel B), Long-Term Orientation (Panel C), School Resources (Panel D) and Decision Making (Panel E) and Instructional Innovation (Panel F) Moderated the Relation Between Teachers' Growth Mindset and Students' Learning Engagement

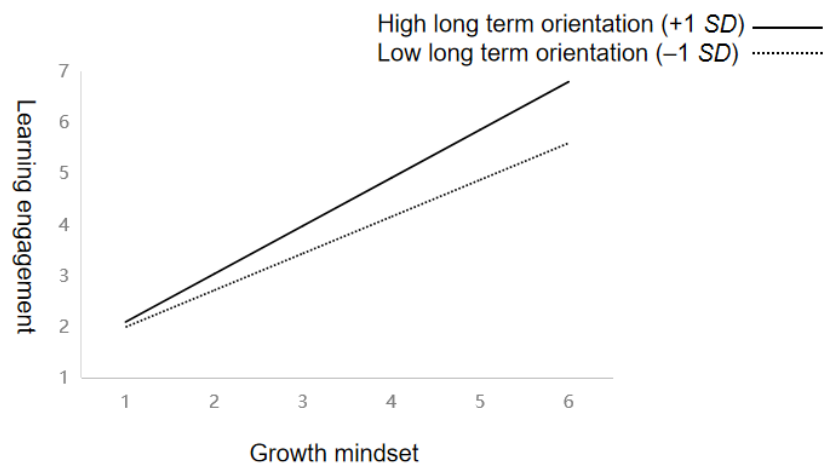
Panel A



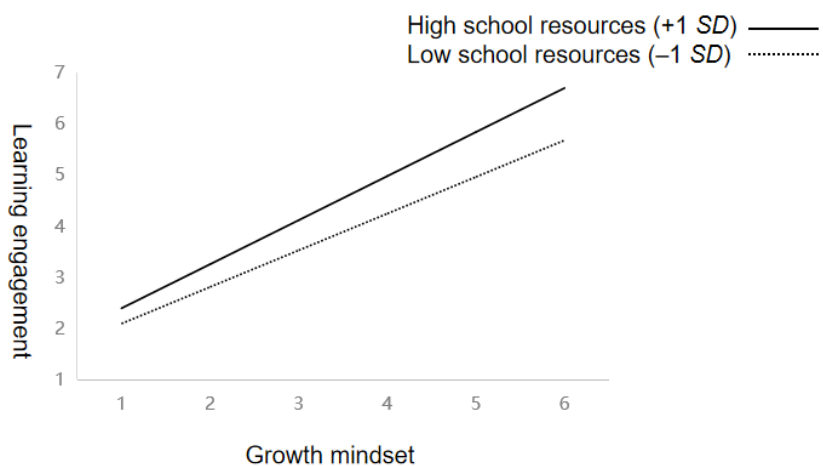
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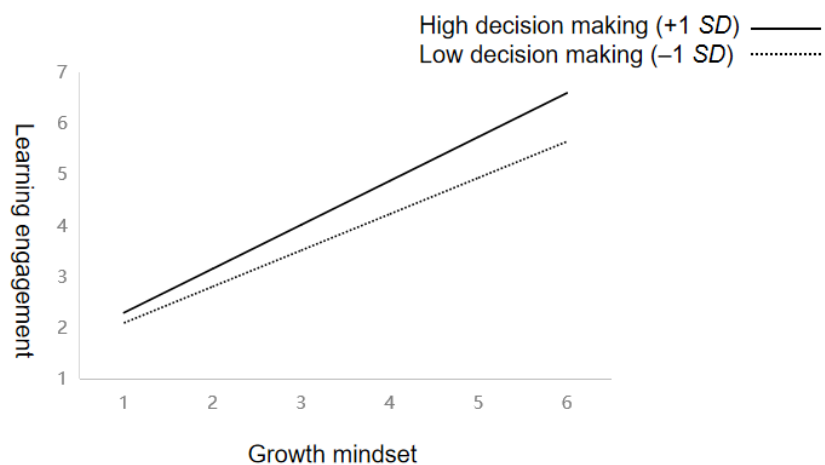
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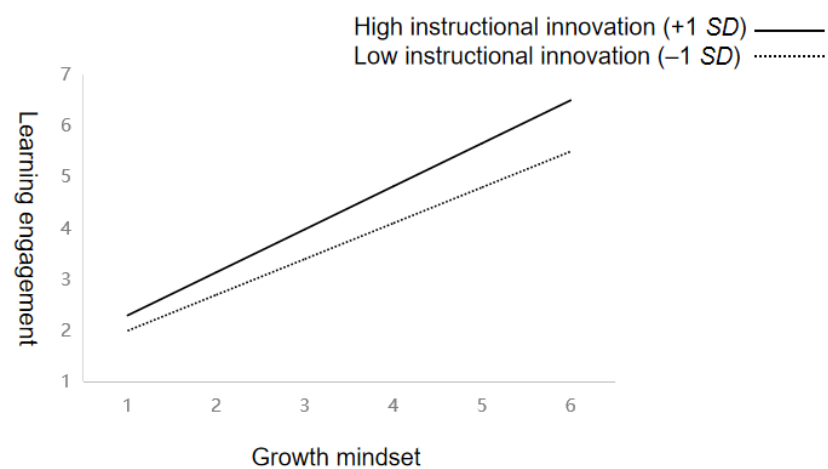
Panel D



Panel E



Panel F



Appendix A

Growth Mindset Inventory

Please rate your level of agreement with each statement.

(1 is extremely agree, 2 is very agree, 3 is somewhat agree, 4 is somewhat disagree, 5 is very disagree, 6 is extremely disagree)

	1	2	3	4	5	6
1. Even your basic intelligence level can be increased considerably						
2. Your intelligence can always be substantially increased						
3. No matter how much intelligence you have, it can always be increased quite a bit						
4. No matter who you are, your intelligence can be significantly increased						



Appendix B

Cultural Values Scale

Please rate your level of agreement with each statement.

(From items 1-4, 1 means strongly disagree, 2 means disagree, 3 means neither disagree nor agree, 4 means agree, 5 means strongly agree. For item 5, 1 means not at all important, 2 means not important, 3 means neither important nor not important, 4 means important, 5 means very important.)

	1	2	3	4	5
Theme I Power distance					
1. People in higher positions should make most decisions without consulting people in lower positions.					
2. People in higher positions should not ask the opinions of people in lower positions too frequently.					
3. People in higher positions should avoid social interaction with people in lower positions.					
4. People in lower positions should not disagree with decisions by people in higher positions.					
5. People in higher positions should not delegate important tasks to people in lower positions.					
Theme II Uncertainty avoidance					
1. It is important to have instructions spelled out in detail so that I always know what I'm expected to do.					
2. It is important to closely follow instructions and procedures.					
3. Rules and regulations are important because they inform me of what is expected of me.					
4. Standardized work procedures are helpful.					
5. Instructions for operations are important.					



Theme III Individualism					
1. Individuals should sacrifice self-interest for the group (either at school or the work place).					
2. Individuals should stick with the group even through difficulties.					
3. Group welfare is more important than individual rewards.					
4. Group success is more important than individual success.					
5. Individuals should only pursue their goals after considering the welfare of the group.					
6. Group loyalty should be encouraged even if individual goals suffer.					
Theme IV Motivation towards achievement and success					
1. It is more important for men to have a professional career than it is for women.					
2. Men usually solve problems with logical analysis; women usually solve problems with intuition.					
3. Solving difficult problems usually requires an active, forcible approach, which is typical of men.					
4. There are some jobs that a man can always do better than a woman.					
	1	2	3	4	5
Theme V long-term Orientation					
1. Careful management of money (Thrift).					
2. Going on resolutely in spite of opposition (Persistence).					
3. Personal steadiness and stability.					
4. Long-term planning.					
5. Giving up today's fun for success in the future.					
6. Working hard for success in the future.					



Appendix C

School-Level Environment Questionnaire

Please rate your level of agreement with each statement.

(1 is strongly disagree, 2 is disagree, 3 is neither agree nor disagree, 4 is agree, 5 is strongly agree)

	1	2	3	4	5
Theme I Collaboration					
1. Classroom instruction is rarely coordinated across teachers.					
2. I have regular opportunities to work with other teachers.					
3. There is good communication among teachers.					
4. Good teamwork is not emphasized enough at my school.					
5. I seldom discuss the needs of individual students with other teachers.					
6. Teachers design instructional programs together.					
Theme II Student Relations					
1. Most students are well mannered or respectful of the school staff.					
2. Students in this school are well behaved.					
3. Most students are helpful and cooperative with teachers.					



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4. Most students are motivated to learn.					
Theme III School Resources					
1. The supply of equipment and resources is not adequate.					
2. Instructional equipment is not consistently accessible.					
3. Video equipment, tapes, and films are readily available.					
4. The school library has sufficient resources and materials.					
Theme IV Decision Making					
1. Teachers are frequently asked to participate in decisions.					
2. I have very little to say in the running of the school.					
3. Decisions about the school are made by the principal.					
Theme V Instructional Innovation					
1. We are willing to try new teaching approaches in my school.					
2. New and different ideas are always being tried out.					
3. Teachers in this school are innovative.					
4. Teachers in this school are innovative.					



Appendix D

Academic Motivation Scale

Please rate your level of agreement with each statement.

(1 means strongly disagree, 2 means disagree, 3 means slightly disagree, 4 means neutral, 5 means slightly agree, 6 means agree, and 7 means strongly agree)

	1	2	3	4	5	6	7
Theme I Intrinsic Motivation to Know							
1. I go to school because I experience pleasure and satisfaction while learning new things.							
2. I study because I like to discover new knowledge.							
3. I study because it satisfies my curiosity about the world.							
4. I learn because I enjoy understanding complex things.							
Theme II Intrinsic Motivation Toward Accomplishment							
5. I study because I enjoy achieving objectives that I set for myself.							
6. I go to school because I feel proud when I master difficult tasks.							
7. I enjoy learning because it gives me a sense of accomplishment.							
8. I study because it feels rewarding to improve my abilities.							
Theme III Intrinsic Motivation to Experience Stimulation							
9. I go to school because I enjoy the excitement of learning new concepts.							
10. I study because I find it thrilling to solve challenging problems.							
11. I learn because the process of studying is stimulating.							



12. I study because I enjoy the stimulation it provides.							
Theme IV Extrinsic Motivation - External Regulation							
13. I study because I need good grades for my future.							
14. I go to school to satisfy the demands of my family.							
15. I learn because I want to meet others' expectations of me.							
16. I study because it is required to achieve my goals.							
Theme V Extrinsic Motivation - Introjected Regulation							
17. I study because I would feel ashamed if I didn't do well.							
18. I go to school to prove to myself that I am capable.							
19. I study because I want to avoid feeling guilty about not doing my best.							
20. I learn because I want to maintain a sense of self-worth.							
Theme VI Extrinsic Motivation - Identified Regulation							
21. I go to school because I think it is important for my future.							
22. I study because I value the knowledge and skills I gain.							
23. I learn because I understand how it relates to my personal goals.							
24. I go to school because I see the value in education for my long-term success.							
Theme VII Amotivation							
25. I don't know why I go to school, I feel like I am wasting my time.							
26. I study but I don't really see its relevance to my life.							
27. I go to school because I don't know what else to do.							
28. I study without really knowing why.							



Appendix E

Learning Self-Efficacy Scale

Please rate your level of agreement with each statement.

(1 means strongly disagree, 2 means disagree, 3 means agree, 4 means strongly agree.)

	1	2	3	4
1. I can always manage to solve difficult problems if I try hard enough				
2. If someone opposes me, I can find the means and ways to get what I want				
3. It is easy for me to stick to my aims and accomplish my goals				
4. I am confident that I could deal efficiently with unexpected events				
5. Thanks to my resourcefulness, I know how to handle unforeseen situations				
6. I can solve most problems if I invest the necessary effort				
7. I can remain calm when facing difficulties because I can rely on my coping				
8. When I am confronted with a problem, I can usually find several solutions				
9. If I am in trouble, I can usually think of a solution				
10. I can usually handle whatever comes my way				



Appendix F

Learned Helplessness Scale

Please rate your level of agreement with each statement.

(1 means strongly agree, 2 means agree, 3 means agree, 4 means strongly agree.)

	1	2	3	4
1. No matter how much energy I put into a task, I feel I have no control over the outcome.				
2. I feel that my ability to solve problems is the cause of my success.				
3. I cannot find solutions to difficult problems.				
4. I don't place myself in situations in which I cannot predict the outcome.				
5. If I complete a task successfully, it is probably because of my ability.				
6. I have the ability to solve most of life's problems.				
7. When I do not succeed at a task, I do not attempt any similar tasks because I feel that I would fail them also.				
8. When something doesn't turn out the way I planned, I know it is because I didn't have the ability to start with				
9. Other people have more control over their success and/or failure than I do.				



10. I try new tasks if I have failed similar ones in the past.				
11. When I perform poorly, it is because I don't have the ability to perform better.				
12. I accept tasks even if I am not sure that I will success at them.				
13. I feel that I have little control over the outcomes of my work.				
14. I am successful at most tasks I try.				
15. I feel that anyone else could be better than me at most tasks.				
16. I am able to reach my goals in life.				
17. When I don't succeed at a task, I find myself blaming my own stupidity for my failure.				
18. No matter how hard I try, things never seem to work out the way I want them to.				
19. I feel that my success reflects my ability, not chance.				
20. My behavior seems to influence the success of a work group.				



Appendix G

Utrecht Work Engagement Scale for Students

Please rate your level of agreement with each statement.

1 is strongly disagree, 2 is disagree, 3 is somewhat disagree, 4 is neither agree nor disagree, 5 is somewhat agree, 6 is agree, 7 is strongly agree

	1	2	3	4	5	6	7
1. When I wake up in the morning, I am eager to go learn							
2. While studying, I feel energized							
3. Even if studying is not going smoothly, I don't get discouraged and can persevere							
4. I can study for a long time without needing a break							
5. Even when mentally tired while studying, I can quickly recover							
6. When studying, I feel strong and motivated							
7. I find learning to be challenging and stimulating							



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8.Studying inspires my creativity							
9.I am passionate about learning							
10.I am proud of my learning achievements							
11.I find my learning goals to be clear and meaningful							
12.When studying, I forget about everything around me							
13.Time passes quickly when I am studying							
14.While studying, my mind is focused solely on learning.							
15.It is hard for me to put down my study materials							
16.I am immersed in learning							
17.When fully engaged in learning, I feel happy							



Appendix H

Semi-Structured Interview Questions

1. What is your thinking of intelligence?
2. Do you think intelligence is changeable or unchangeable? (If participant consent he has a belief of intelligence in Q1)
3. What would you do when students have learning challenges?
4. What would you do when students have learning obstacles?
5. What would you think of the purpose of students making efforts in their study?
6. How do you view criticism to students?
7. What is your thoughts on the influence of success of others on students?
8. What cultural orientation you think you have?
9. What cultural orientation you think that shape your perception of intelligence? (If participant express positive response in Q8)
10. What do you know about your school policy?
11. Do your school's climate help or hinder you from implementing your belief in intelligence in classroom?
12. In terms of teachers' growth mindset cultivation, what supports you are required of?
13. Is there anything else that you would like to talk about?



Appendix I

Classroom Observations Form

Name (pseudonym)	Challenges			Obstacles			Efforts			Criticism			Praise			Success of others		
	-	N	+	-	N	+	-	N	+	-	N	+	-	N	+	-	N	+



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Appendix J

Participant Forms, Information Sheet, Letter of Invitation

Participant Forms

I _____ hereby consent to participate in the captioned research supervised by Dr. HE WU Jing, Mavis and conducted by ZHANG Kai, who are staff / students of Department of Special Education & Counselling in The Education University of Hong Kong.

I understand that information obtained from this research may be used in future research and may be published. However, my right to privacy will be retained, i.e., my personal details will not be revealed.

The procedure as set out in the attached information sheet has been fully explained. I understand the benefits and risks involved. My participation in the project is voluntary.

I acknowledge that I have the right to question any part of the procedure and can withdraw at any time without negative consequences.

Name of participant

Signature of participant

Date

Information Sheet

You are invited to participate in a project supervised by Dr. HE WU Jing and conducted by ZHANG Kai, who are staff / students of the Department of Special Education & Counselling in The Education University of Hong Kong.

This study is carried out for three purposes. First, it looks at teachers' belief of intelligence and the flowing teaching practice. Second, it explores the cultural orientation and perceived school climate's influence on teachers' formation of intelligence. Third, it explores the relation between teachers' mindset and students' learning-related outcomes.

Teachers who participate will be required to fill out the provided questionnaire, undergo two interviews, and have their classroom activities observed via video recording, which is expected to take approximately 15, 40, and 45 minutes respectively. Additionally, students will be included in the classroom observation, and there will be no compensation for participation. All of the interviews will be audiotaped and class observations will be videotaped.

No potential risks will be involved in this study.

Your participation in the project is voluntary. You have every right to withdraw from the study at any time without negative consequences. All information related to you will remain confidential, and will be identifiable by codes known only to the researcher.

The results will be used for this study, which may be published as a paper, journal article/book/chapter, conference presentation, on-line web based report, report to organization

and oral presentation, and the identity of all those involved in this study will be anonymous.

If you would like to obtain more information about this study, please contact ZHANG Kai at telephone number 86 or their supervisor HE WU Jing, Mavis at telephone number 852

If you have any concerns about the conduct of this research study, please do not hesitate to contact the Human Research Ethics Committee by email at hrec@eduhk.hk or by mail to Research and Development Office, The Education University of Hong Kong.

Thank you for your interest in participating in this study.

ZHANG Kai

Principal Investigator

Letter of Invitation

Dear Mr/Ms Principal.

I would like to invite teachers in your school to participate in a survey on teachers' intellectual beliefs and cultural dispositions. The purpose of this survey is to understand current teachers' perceptions of intelligence and the impact of personal cultural dispositions on the formation of intellectual beliefs, so as to know how the two relate to teaching practice. The results of the study will benefit the development of teacher education and have presumed implications for the advancement of pedagogical norms.

This study has three stages, the first of which consists of two kinds of test scales, the teachers' intellectual beliefs questionnaire and the teachers' cultural values scales, and takes approximately 5-10 minutes to complete. The second stage consisted of a randomly selected 20 teachers who participated in the first stage being interviewed twice for approximately 50 minutes to gain insight into their perceptions of their intellectual beliefs. The third stage is a classroom observation (recording) of one lesson to visualise the teachers' use of their intellectual beliefs in their classroom practice. Also, students' learning-related outcomes, including their learning motivation, self-efficacy, helplessness and engagement to explore its relation to teachers' mindset.

I hope you will consider my invitation and, if so, please forward this email to the teachers in your school for me. This study has been endorsed by the Human Research Ethics Committee of the Hong Kong University of Education. Participant Information Sheet, Participant Consent Form, Questionnaire of Teacher's Belief of Intelligence and Teachers' Cultural Values Scale have been placed in the attachment for your reference.

Researcher: Kai Zhang

Contact:

Appendix K

Sample Coding

Theme	Category	Code	Example
Intelligence is fixed or malleable quality	Growth mindset	Intelligence can grow with effort	"Intelligence isn't fixed. I tell my students that their efforts and willingness to learn from mistakes define their growth." - Elizabeth (Growth Mindset Inventory score: 6)
	Fixed mindset	Intelligence is innate and fixed	"Intelligence is something you're born with and can't really change. It's about recognizing and working within those limits." - Michael (Growth Mindset Inventory score: 2)
Learning is more about process or results	Process-oriented learning	Focus on learning enjoyment and engagement	"Our priority should be the learning experience of our students. It is through finding joy in learning that we can truly appreciate its value." - Isabella (Growth Mindset Inventory score: 6)
	Results-oriented learning	Focus on achieving high academic scores	"Academic results are a more comprehensive measure of a student's efforts. We focus on results because it helps students succeed." - Quinn (Growth Mindset Inventory score: 2)
Strategy used to encourage students to deal with challenges and obstacles	Student-centered approach	Encouraging persistence and resilience	"Embracing a student-centered approach allows us to tailor our teaching to meet unique needs." - David (Growth Mindset Inventory score: 6)
	Structured approach	Repetitive practice and adherence to standards	"I find that repetition helps students become more confident in their abilities. Familiarity builds competence." - Owen (Growth Mindset Inventory score: 2)
Teachers' views about feedback on students' learning progress	Process-oriented feedback	Highlighting effort and learning strategies	"I focus on encouragement over praise, highlighting that it's effort and behavior that lead to progress." - Hannah (Growth Mindset Inventory score: 6)
	Ability-oriented feedback	Praising innate ability and intelligence	"I usually say, 'Well done, you clever boy/girl,' because praising intelligence helps build their confidence." - Steven (Growth Mindset Inventory score: 2)
The role of teacher as a facilitator or controller	Facilitator role	Supporting autonomy and self-learning	"I want my students to learn to teach themselves; it's a lifelong skill." - Gabrielle (Growth Mindset Inventory score: 6)
	Controller role	Maintaining strict control to meet objectives	"I provide clear goals and maintain strict control to ensure all objectives are met." - Laura (Growth Mindset Inventory score: 2)
Contextual factors help or hinder teachers to implement their mindset in classroom	Supportive factors	Encouraging autonomy and providing resources	"The supportive environment helps me encourage autonomy and a growth mindset." - Rachel (Growth Mindset Inventory score: 6)
	Hindering factors	Prioritizing test scores and performance metrics	"The school's focus on test scores restricts my ability to fully implement growth mindset strategies." - Jacob (Growth Mindset Inventory score: 6)

