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Research Article

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A Case Study of A-Level Learners' Mindsets in an International Education Institution in China

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Abstract

This case study examines the learning mindsets of A-level students at an international school in China through a long-term follow-up study and multilevel thematic comparison. Multiple methods, including questionnaires, interviews, informal observations, and document analysis, were used to produce detailed and comprehensive descriptions. The research focuses on three areas: the characteristics of students' learning mindsets in this environment, the factors influencing these mindsets, and teachers' responses. The findings show that most students here have mixed learning mindsets and identify the factors that influence these mindsets. The study recommends that teachers receive training and offers mindset intervention strategies for this setting. The follow-up study improves understanding of the relationship between learning mindsets and other factors such as effort, learning strategies, and help-seeking behavior.

Keywords: Learning Mindset, Growth Mindset, Fixed Mindset, Driving Factors, Teacher Training, and Mindset Intervention

1. Introduction

Dweck's mindset theory identifies two main mindsets —'fixed' (believing intelligence and abilities are innate and unchangeable, which leads to avoiding challenges) and 'growth' (believing intelligence and abilities can develop through effort, promoting complex problem-solving)—that significantly influence academic success [1-3]. Although this theory has been widely supported in Western education, its application in China remains mostly limited to public schools [4-7]. Chinese international schools, which offer cross-cultural curricula (e.g., A-level) and serve students transitioning from the national education system, represent a unique context that has not been thoroughly explored by previous research.

1.1. Contextual Differences: Chinese vs. Western Mindsets

Western studies connect low socioeconomic status (SES) to fixed mindsets and poor academic performance [8]. In contrast, OECD data show Chinese students—even from disadvantaged backgrounds—demonstrate strong motivation to learn and resilience, fueled by China's high-stakes testing system (e.g., Gaokao) and cultural values of diligence [9,10]. Sun et al. also note that Chinese students see intelligence as "innate fluid ability" (vs. Western "acquired crystallized ability") but believe diligence helps close ability gaps, creating a unique mindset [11].

1.2. Research Gaps

Previous research shows that growth mindsets improve academic performance, but few studies examine what influences mindset for A-level students in China [12,13]. Limeri et al. identified factors for undergraduates, but their sample differs from 15–18-year-old A-level students transitioning from China's national curriculum [14]. Furthermore, A-level's flexible course options and modular retakes contrast sharply with the Gaokao's "one-shot" pressure, which may affect students' mindsets.

1.3. Research Questions

As stated above, the research questions are as follows:

i. What are the learners' mindsets while they are learning in this setting?
ii. What key factors drive these learners' current learning mindsets?
iii. Are the teachers well-prepared for these learners in this setting?

2. Literature Review

2.1. Conceptualization of the Mindset Theory

Dweck's mindset theory evolved from observations of individual differences, building on Gottlieb's (1991, cited in Bateson & Logan) "gene-environment interaction" and Sternberg's "purposeful engagement" (effort, persistence) as driving factors of outcomes [2,15,16]. Core distinctions include:

- **Growth mindset:** Belief in the ability to improve, combined with self-awareness, deliberate effort, and seeking help [12].
- **Fixed mindset:** Belief in innate ability, combined with unclear self-perception, fear of judgment, and avoidance of challenges [12].

Critiques question the effectiveness of growth mindset, but Yeager & Dweck clarify that mindsets only work in specific contexts (e.g., effective teacher feedback, culturally aligned curricula)—which is essential in East Asia's competitive settings [17,18].

2.2. Chinese vs. Western Students' Mindsets

- **Cultural differences:** Chinese students in high-stakes systems (e.g., Gaokao) associate formative assessment with growth mindsets, unlike their Western peers [19].
- **Intelligence definitions:** Chinese students associate intelligence with innate ability but emphasize diligence, balancing "fixed ability beliefs" with "growth-oriented behavior" [11].
- **Socioeconomic status (SES) effects:** Unlike Western low-SES students, Chinese low-SES students stay highly motivated, because they see education as key to social mobility [8,9].

2.3. Key Drivers of Learning Mindsets

Drawing on Limeri et al. and subsequent research, key drivers include [14]:

- **Academic performance:** Low achievement encourages fixed mindsets; high achievement promotes growth mindsets [20,21].
- **Peer interaction:** Motivated peers promote growth mindsets, while negative peer cultures hinder them [2,22].
- **Cognitive processes:** Growth mindsets are linked to feedback-seeking and self-regulation, while fixed mindsets are associated with feedback avoidance [23,24].
- **Societal cues and stereotypes:** Gender, ethnicity, and SES shape mindsets; higher SES links to more positive attitudes [21,25,26].
- **Family factors:** Process-oriented parental feedback (e.g., "you tried hard") encourages growth mindsets, while person-oriented feedback (e.g., "you're smart") supports fixed mindsets [27,28].
- **School environment:** Supportive climates and formative assessment promote growth mindsets; restrictive systems hinder low achievers [19,29].
- **Teachers' Role in Shaping Mindsets:** Teachers influence mindsets via:

(i) **Feedback:** Constructive feedback (focused on effort and strategy) promotes growth mindsets; ability labeling (e.g., "you're bad at math") encourages fixed mindsets [30,31].

(ii) **Agency:** Teachers with high agency (proactive, student-centered) foster resilience and self-regulation; teachers with a fixed mindset develop implicit biases [32-34].

(iii) **Professional knowledge:** Not receiving mindset theory training results in misinterpreting student behavior [35,36].

2.4. Practical Significance of Mindset Interventions

Effective interventions require context sensitivity [37]:

- **Cultural alignment:** Interventions targeting "emotion mindsets" (vs. intelligence) are more effective for Chinese students [6].
- **Long-term engagement:** Short-term interventions do not change mindsets; online tutoring proves more effective than lectures or reading [5,38].
- **Synergistic factors:** Combining mindset training with supportive environments and utility value improves outcomes [39,40].

3. Methodology

3.1. Positionality

The researcher is a mathematics teacher at the study school with 11 years of experience teaching China's national curriculum and 3 years of A-level instruction. As an 'insider researcher', I maintained rapport with students and colleagues but reduced subjectivity through prior approval from the headmaster and participants, bracketing preconceptions during data collection and analysis, and ensuring confidentiality [41,42].

3.2. Paradigm

I adopted 'interpretivism' because learning mindsets are subjective constructs shaped by social interaction [43-45]. This paradigm aligns with my focus on context-specific dynamics (such as cross-cultural curriculum and student transitions) and the use of mixed methods (quantitative: gender-based analysis; qualitative: interviews).

3.3. Methods

An 'exploratory case study' was used to examine mindset traits and drivers beyond descriptive analysis [46]. Mixed methods (questionnaires, interviews, observations, document analysis) ensured triangulation, which enhanced credibility [47-49].

3.4. Data Collection

Data were collected from March to May 2023 (see Appendix 1 for schedule):

- **Questionnaires:** 45 distributed, 44 valid (13 closed, 3 open questions). Focus areas:
  - Mindsets (Q1–5): Identify fixed and growth traits.
  - Drivers (Q6–17): Family (Q6–8), learning environment (Q9–10), peers (Q11), academic performance (Q12–13), teacher feedback (Q14–17).
- **Interviews:**
  - Students: 9 (4 boys, 5 girls) across 3 grades (fresh/middle/old) and three ability levels (low/medium/high); semi-structured format to explore mindset drivers.
  - Teachers/Teaching Assistants (TAs): four teachers (two male,

two female) and two TAs to evaluate teacher readiness; TAs provided cross-validation [50].

- **Informal observations:** 2.5 months (March-May 2023) of naturalistic behavior tracking (e.g., class participation, study habits) to validate questionnaire/interview data.
- **Documents:** Academic records (exam scores, college applications), and follow-ups over 6–24 months to connect mindsets with outcomes.

3.5. Data Analysis

- **Quantitative:** Descriptive statistics (mindset distribution, driver importance) and Chi-square tests (gender differences).
- **Qualitative:** Thematic analysis to code interview and observation data; iterative comparison with questionnaire data to refine themes [51].

3.6. Ethical Considerations

- **Informed consent:** Obtained from participants (or guardians for minors); confidentiality and anonymity assured.
- **Power balance:** TAs distributed or collected questionnaires; interviewers emphasized roles as "researchers" (not teachers) [52].
- **Benefit over harm:** Students received growth mindset training offers; schedules avoided exam periods [53].
- **Language accessibility:** Bilingual (English/Chinese) questionnaires; "teacher agency" rephrased as "teacher behavior" for clarity.

3.7. Data Storage

Paper copies (questionnaires, field notes) were digitized, and audio recordings were transcribed and translated. All data were pseudonymized: paper copies are locked, and electronic files are password protected (Appendix 2) [54].

4. Results

This chapter will present and analyze the data based on the research questions, which serve as the three themes of this study. The data are shown with high credibility through detailed descriptions and comparative analysis across multiple levels.

(i) What Are the Learners' Learning Mindsets during Their Learning Journey in This Setting?

The overall picture of the learners' learning mindsets is summarized here. In this study, 45 questionnaires were collected, but one was discarded as invalid, leaving 44 valid responses. The first five items aimed to identify students' learning mindsets. According to the data (see Figure 1), most students in this setting display growth mindsets: 72.7% believe abilities develop through effort, 81.8% seek peer help or persist when solving complex problems (rather than waiting for teacher explanations), and 90.9% remain positive after experiencing failure.

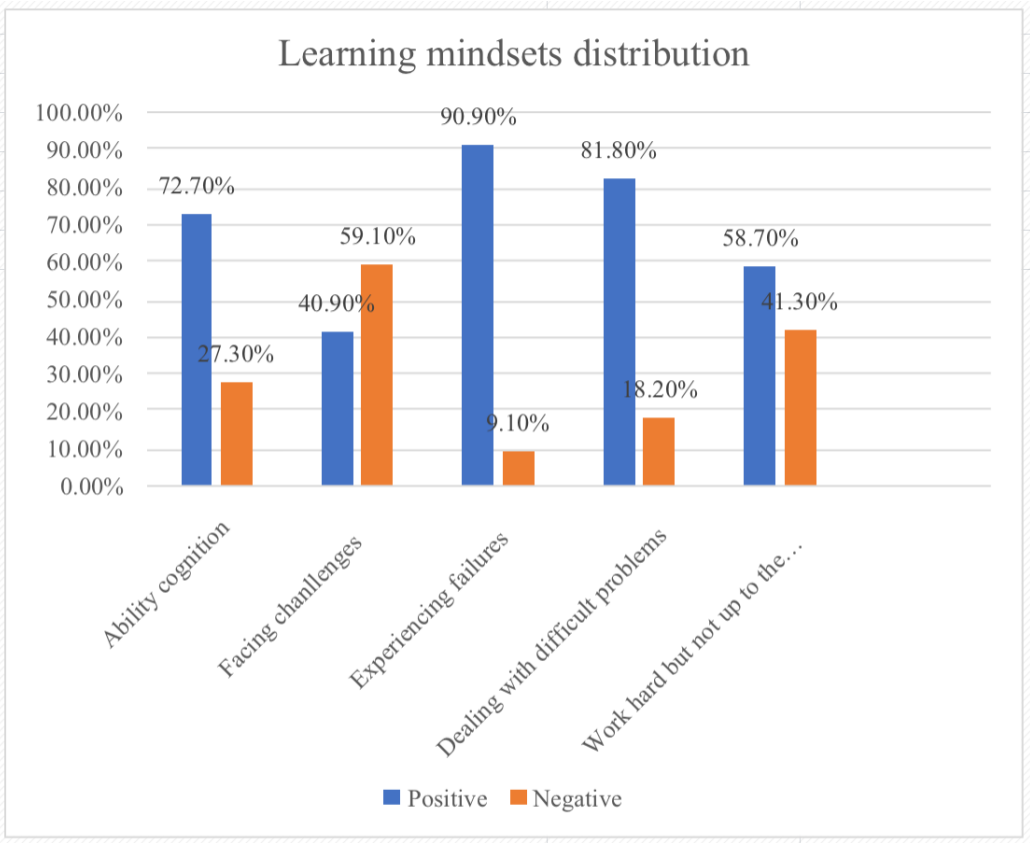

Figure 1: Learning Mindsets Distribution

However, when academic expectations were not met despite effort, 58.7% of students adjusted their strategies, 28.3% increased their effort, and 13% gave up. Strategy adjustment aligns with Paunesku et al.'s formula: Growth = Effort + Strategy + Help from others [12]. Notably, nearly 60% of students responded passively to challenges—avoiding them or only engaging superficially—instead of trying to overcome them. This behavior is linked to the high-stakes testing system, where some students focus more on exam-oriented knowledge (e.g., Student C, March 20, 2023).

Gender differentiation in learning mindsets. Out of 44 questionnaires, nine either lacked gender information or had altered responses, leaving 35 (14 boys, 21 girls) for gender analysis. The decision not to label or modify genders may reflect "teenagers' social construction of genders versus biological genders", although this is beyond the research scope. Another possibility is that students' fear of social judgment influenced their responses [55].

A contingency table (see Figure 2) was created with coded scores (0 = negative, 5 = neutral, 10 = positive) for the first five items. A Chi-square test (see Figure 3) yielded a p-value of 0.07, indicating no significant gender difference at the 5% level but significance at 10%.

Keyfactor * Gender Contingency Table

			Gender		
			boys	girls	Total
Keyfactor	Ability	Observed Socre	115	175	290
		Expected Score	128.5	161.5	290.0
	Challenge	Observed Socre	110	135	245
		Expected Score	108.5	136.5	245.0
	Failure	Observed Socre	85	120	205
		Expected Score	90.8	114.2	205.0
	Difficult Problems	Observed Socre	100	90	190
		Expected Score	84.2	105.8	190.0
	Hard-work	Observed Socre	115	140	255
		Expected Score	113.0	142.0	255.0
Total		Observed Socre	525	660	1185
		Expected Score	525.0	660.0	1185.0

Figure 2: The Gender Contingency

Chi-Squared Test

	Value	Degrees of freedom	P-value
Pearson's Chi-Square	8.650[a]	4	.070
Likelihood ratio	8.633	4	.071
Correlation	3.205	1	.073
Total score	1185		

a. 0 cells (0.0%) has an expected count less than 5. The minimum expected count is 84.18.

Figure 3: Chi-Squared Test

Ratio analysis of coded scores (see Figure 4) showed: (a) the boys-to-girls ratio in ability cognition (65.7%) closely matches the baseline ratio (66.7%); (b) boys exhibited higher rates in challenge-seeking (81.5%) and adaptive effort (82.1%), indicating greater learning adventurousness; (c) boys had a significantly higher ratio in independent problem-solving (111.1%), while girls preferred peer help. Thus, although boys and girls have similar mindsets, they differ in their learning approaches.

Genders	Key factors				
	Ability cognition	Facing challenge	Experiencing failures	Dealing with difficult problems	Work hard but not up to the expectations
Boys (14 items)	115	110	85	100	115
Girls (21 items)	175	135	120	90	140
Ratios (2:3=66.7%)	65.7%	81.5%	70.8%	111.1%	82.1%

Figure 4: Gender Ratio Analysis

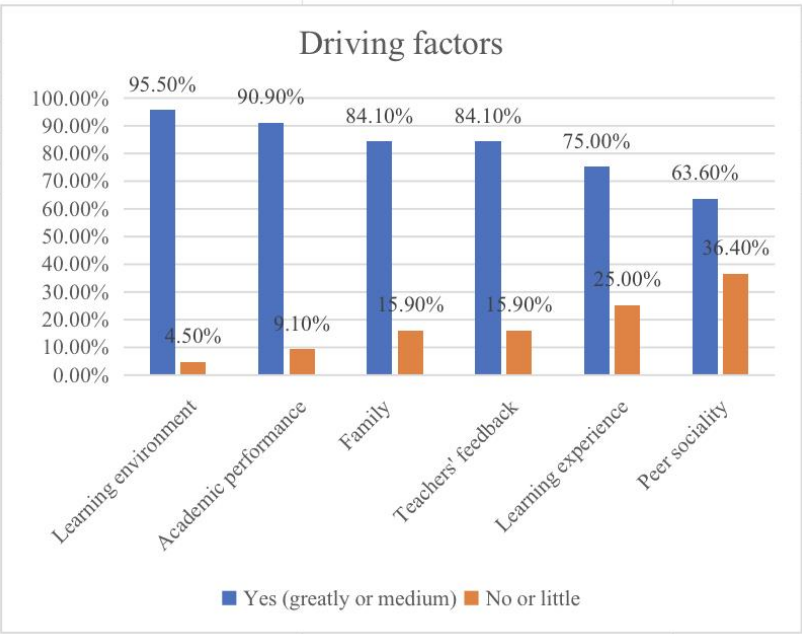

Figure 5: Driving Factors Analysis

Comparative Analysis. Although most students showed positive attitudes toward their learning mindsets, the teachers and teaching assistants had more negative evaluations. In interviews, the four teachers and two teaching assistants believed that more than half of the students in my setting held fixed learning mindsets, while fewer than half embraced growth mindsets. Teachers stated that most students lack initiative in learning, passively completing tasks assigned by the teachers; some students avoid the tasks, and only a few can learn actively under any circumstances and sustain growth.

In student interviews, some students (such as Students C and E, March 2023) explained the learning mindset issues that teachers addressed. These students claimed that the current learning pressure was lower than that of the original domestic courses, so they did not need to invest too much energy initially but started engaging in learning just before exams. Informal observations and academic performance records supported what the students said. At the beginning of the semester, most students were more relaxed about their learning. But by midterm, they began to study hard, and some students managed to achieve relatively good scores through this approach (such as Students A, B, C, E, G). These students could be categorized as holding a mixed mindset. However, a few students lacked clear self-awareness. They used the same strategies toward learning but found it was too late to start studying hard and became easily anxious about their performance, ultimately resulting in unsatisfactory grades (such as Students D and H). These students held strong fixed mindsets. A small number of students maintained good study habits throughout the semester. They worked very hard and stuck to their study plans, even during periods of high stress (such as Students F and I). Therefore, these students held strong growth mindsets. Overall, most students here have a mixed mindset, with fixed and growth mindset holders being in the minority.

(ii) What Key Factors Drive These Learners' Current Learning Mindsets?

The questionnaire examined potential driving factors: family,

previous learning experiences, environment, peer sociality, academic performance, and teacher behaviors. Results showed that the learning environment had the greatest influence (95.5%), followed by academic performance (90.9%), family factors and teacher feedback (both 84.1%), previous experiences (75%), and peer sociality (63.6%). Interviews later revealed additional factors such as learning goals and interests, which the questionnaire did not include. Each factor is discussed in terms of its level of influence, along with supporting findings and factors like family, past learning experiences, environment, peer sociality, academic performance, and teacher behaviors.

Learning environment. The learning environment constantly shapes students' mindsets, ranking highest in student self-reports [29]. Interviews and observations support this:
Student B (March 24, 2023): "I like the current environment—help is available from classmates and teachers. In my public school, the atmosphere was depressing; loneliness prevailed without friends."

Student E (March 29, 2023): "I hated stressful environments in junior high — they made me depressed. The relaxed international school atmosphere suits me."

Some students, such as G and I, reported adapting to any environment. Student I (April 3, 2023) valued the discipline in public schools but appreciated the current environment's support for cognitive growth.

Teachers and Teaching Assistants (TAs) offered diverse perspectives.
TA1 (April 28, 2023): The environment here provides more attention than public schools, fostering positive mindsets.

Teacher 2 (April 12, 2023): Quiet environments support Business/ Economics learning; unguided peer discussions may reinforce misconceptions.

Teachers 1, 3 (April 12, 24, 2023): Stress can encourage progress, but some students find it difficult.

Teacher 4 (April 28, 2023) / TA 2 (April 29, 2023): Disciplined students succeed regardless of the environment.

Academic performance. Academic performance significantly influences mindsets, with early results shaping core beliefs [24,25,56]. A-level students associate grades with ability.

Student D (March 27, 2023): "My average grades make me feel intellectually mediocre; change seems impossible."

Student E (March 29, 2023): "My grades stagnate, so I see abilities as fixed."

Teachers and TAs agree with this statement; for example, Teacher 2 (April 12, 2023) believes grades directly reflect students' ability, especially in new subjects like Economics.

Student F (March 28, 2023): "High school entrance exam failure convinced me I'm academically inferior—it still haunts me."

TA1 (April 28, 2023)/TA2 (April 29, 2023): Good grades boost motivation, while failure can be demoralizing.

Meanwhile, some teachers (1, 3, 4) argued that poor performance can promote growth mindsets through reflection, and some students also agree with this idea. For example:
Student C (March 20, 2023): "A bad test drives me to work harder; others' success motivates me."
Student I (April 3, 2023): "I analyze failures and strive to improve; peers' success fuels my effort."

However, students with a fixed mindset like Student D (March 27, 2023) remain vulnerable: "I ignore rankings, but failure still hurts."

Family factors. The findings indicated a weaker family influence, likely due to their age (15–18 years) and established mental habits. Adolescent rebellion may also diminish perceived family impact [57]. Student D (March 27, 2023): "Family influence pales compared to grades; it mainly relieves stress, but I don't share much with my parents."

Family factors and academic performance influence how mindsets develop. Early academic success builds a foundation, while supportive, guided parenting helps prevent fixed mindsets [27]:
Student I (April 3, 2023): "My mom studied with me when my math scores were low in primary school. Her encouragement improved my grades, and now I feel capable."

On the other hand, uninvolved or controlling families encourage fixed mindsets.

Student C (March 20, 2023): "My parents left me with others as a child. I didn't care about their opinions and never pushed myself—results seemed unchangeable."

Student H (April 7, 2023): "Family issues made me lose interest in learning. When I tried to catch up, it was too late."

Student B (March 21, 2023): "Strict parents scolded me for bad grades. If my mom forced me to study, I'd rebel and stop learning."

Teacher factors. Teacher agency significantly affects mindset development [58]. Questionnaire data (Q14) showed students saw teacher feedback as equally influential as family factors. Analyzing open-ended questions (Q15–17; Appendix 3) identified six areas where teachers make an impact.

(a) Responsibility: Correcting assignments promptly and resolving issues patiently fosters positive mindsets; inattention or impatience harms them.
(b) Strategies: Providing strategic feedback, ensuring equal treatment, and offering knowledge guidance were viewed

positively; however, criticism without guidance was regarded as negative.

(c) Encouragement: Genuine support was helpful; empty praise or belittling did more harm than good.
(d) Classroom atmosphere: Lively and organized environments were positive, while tense or critical atmospheres were negative.
(e) Communication: Friendly, supportive interactions were positive, but misunderstandings caused negative effects.
(f) Administrative ability: Clear instructions and high competence were seen as positive; strict teaching or ignorance was regarded as negative.

All students interviewed except Student C agreed on these points. Teachers 1–3 believed A-level students' deep habits limited their influence, while Teacher 4 and TAs emphasized feedback's role in shaping mindsets through encouragement and guidance.

Past learning experiences. Past learning experiences continuously shape mindsets [29]. Half of the interviewed teachers and TAs (1, 2, TA2) noted a feedback loop: strict previous environments led to slacking in relaxed settings. In contrast, others (3, 4, TA1) saw past passivity as a factor in studying abroad. Questionnaire data (Q9) showed 45.5% viewed past experiences negatively, compared to 29.5% who viewed them positively. Exceptions like Students F and I credited challenging experiences, such as the Math Olympiad, with fostering growth mindsets.

Peer sociality. Teenagers are susceptible to peer influence, but student perceptions varied [22]. Questionnaire data showed peer sociality as the least influential factor, with half the students considering it insignificant. Interviews revealed four students viewed peers as positive, while five saw no impact. Teachers and TAs (except Teacher 2) emphasized peer influence: motivated friends boosted learning, while negative peers hindered it.

Learning goals and interests. These emerged from interviews, as they were not addressed in the questionnaire. Fixed-mindset students (e.g., C, E, G) either lacked goals, changed them arbitrarily (e.g., D, H), or feared ambition (e.g., A, B). Growth-mindset students (e.g., F, I) relentlessly pursued goals. Faculty saw goals as ineffective for most, with only a few committed students following through.

Learning interest relates to academic performance in two ways: (1) Interest motivates effort and success (e.g., A, C, D, G, H)—supported by Teacher 2 and TAs. (2) Success increases interest (e.g., B)—supported by Teacher 1. Growth-mindset students (e.g., F, I) study required subjects diligently regardless of interest, as highlighted by Teacher 4.

Other factors. Most teachers and students identified addiction to games, short videos, and recreational activities (e.g., celebrity chasing) as negative influences on learning mindsets (Teacher 2; TAs 1, 2; Students E, H). Some teachers (Teacher 1) linked high-tech convenience to learning laziness. Teachers and students also noted that utilitarianism fosters passive attitudes, as students study unrelated subjects for career goals (Teacher 3; Student C).

Positive regulators included visual conversation (Student D), non-academic talents (Student G), sports, and genetic advantages (Student I). Excessive adult expectations (Student F) were seen as negative, raising academic anxiety.

(iii) Are the Teachers well Prepared for These Learners in This Setting?

Lack of understanding about students. Analysis shows teachers have more negative views of students' mindsets than students have of themselves. Teachers often see intelligence as changeable, while students focus on fixed intelligence [6]. Teachers tend to overemphasize family influence and underestimate their role in changing mindsets, probably because they have limited knowledge of mindset theory and intervention strategies.

Lacking comprehensive strategies. While teachers adapted methods for different mindsets (e.g., Teacher 4's feedback nuance), they did not have systematic strategies. For example, Teacher 3 encouraged students with psychological issues, scolded lazy students, and abandoned students who lack motivation.

TAs reported student complaints about ineffective teaching methods.

The differentiation of teacher identities. Positive teachers embraced professional growth (e.g., Teachers 1, 2, 4), while negative-minded teachers (e.g., Teacher 3) exhibited low initiative.

The significance of professional training. Inexperienced teachers (Teachers 1, 2) lacked clear development directions, while experienced teachers (Teacher 4) had more defined goals. TAs proposed an ideal teacher development model:

(a) Strong academic skills,
(b) Positive attitude,
(c) Willingness to share and learn
(d) Collaboration with TAs,
(e) Proactive problem solving.

4.1. Follow-up Study

Six-to-24-month follow-ups and 2.5 months of observations revealed (Table 1):

(i) Higher ability correlates with positive mindsets, but early negative experiences (e.g., Student H) had lasting impacts.
(ii) Growth mindsets generally promote positive outcomes, but not always (e.g., Student C), as they require effort, strategies, and support.
(iii) Positive attitudes, effort, and support helped exceed expectations (e.g., Student E).
(iv) Fixed mindsets that used passive strategies led to unsatisfactory outcomes (e.g., Students D, H).
(v) Mixed mindsets with limited effort led to conditional offers (e.g., Student A), which need ongoing effort for unconditional acceptance.

Students	Age Groups	Learning Ability	Learning Mindsets	Hard Working Level	Learning Strategy	Help-seeking Frequency	University Admission Status	QS Rankings of Universities (2023-2025)
A	fresh	low	mixed-fixed	low	passive	medium	University of Sydney (conditional offer)	High*
B	fresh	middle	mixed-fixed	medium	passive	medium	The University of Nottingham	Middle-high
C	fresh	high	mixed-growth	medium	active	medium	The University of Melbourne	High*
D	middle	low	strong fixed	medium	passive	many	Massey University (unconditional offer)	Middle
E	middle	middle	mixed-growth	medium	active	seldom	University College London	Top
F	middle	high	strong growth	high	active	seldom	University College London	Top
G	old	low	mixed-fixed	medium	passive	medium	University of Sydney	High*
H	old	middle	mixed-fixed	low	passive	many	a Community College in United States	Low
I	old	high	strong growth	high	active	seldom	University of Hong Kong	Top

Note: 'High' indicates universities in Australia with top QS World University rankings (year 2023–2025). Although these universities are highly ranked, their admission requirements are lower than those in other regions, such as the UK or Hong Kong. Typically, students' first choice is to attend universities in the UK or Hong Kong.*

Table 1: Follow-up Investigation

5. Discussion

This research uses a case study approach and multiple methods to explore the learning mindsets of A-level students at a Chinese international educational institution. By gathering both quantitative and qualitative data, it identifies the general traits and gender differences in these students' learning mindsets, as well as the factors that influence them at this stage of learning. The study also assesses whether teachers are sufficiently prepared to support students with these learning mindsets. Through observing students' learning behaviors and tracking university admission outcomes, the research reveals the relationship between learning mindsets and academic results, along with the combined effects of other variables. Due to the complex findings from extensive data analysis, this chapter will summarize and emphasize the main topic analysis and its practical applications.

5.1. Learning Mindsets and Behaviors

This study shows that students' self-reported learning mindsets lean more toward growth, while teachers believe most students have fixed mindsets. After cross-verifying with informal observations and academic performance records, the overall learning mindsets of students in our school are mixed: a few have strong fixed mindsets, and a few display robust growth mindsets. This addresses the first research question: What are the learners' learning mindsets during their educational journey in this setting? Specifically, under university pressure, most students exert minimal effort to acquire the necessary knowledge, ignoring non-essential challenges. While boys and girls show no significant difference in mindset awareness, they differ in approach — boys prefer independent problem-solving and competition, whereas girls favor collaborative learning and peer emotional support. Most students tend to avoid challenges, though boys demonstrate more courage than girls.

5.2. The Driving Factors of Learning Mindsets

Questionnaire data reveal the main factors influencing learning mindsets among Chinese A-level students, ranked by importance: learning environment, academic performance, family and teacher factors, past learning experiences, and peer sociality. This addresses the second research question: What are the key factors shaping these learners' current learning mindsets?

Since A-level students spend most of their time at school, the learning environment becomes very influential. Academic performance directly reflects subject-specific skills and greatly shapes mindsets—confirmed by teachers, especially for new subjects. Family factors impact early mindsets, but their influence diminishes during adolescence as mindsets become more stable [28]. Teacher factors affe ct fixed-mindset students more than growth-mindset students. Negative learning experiences in high-stakes systems, like high school entrance exams in China, have lasting effects. Peer sociality is less influential here than in other cultural contexts, which conflicts with teachers' perceptions [14]. Learning interests influence fixed-mindset students, while learning goals motivate growth-mindset students—findings from interview data, as these factors weren't measured in the questionnaire. Additional factors, including electronic distractions,

utilitarian culture, psychological cues (such as genetics and adult expectations), and positive lifestyles (like sports), may also have a significant impact on shaping students' mindsets.

5.3. The Different Cognition of Learning Mindsets between Students and Teachers

For the third question, 'Are teachers well-prepared for these learners?' The answer is no. Teachers and students have different views on what motivates mindset. Teachers often lack a deep understanding of mindset and effective intervention strategies for students with a fixed mindset, mainly because of limited knowledge of mindset theory. Some teachers show negative mindsets and weak professional identities, which hinder proactive problem-solving. Previous research and TAs' feedback suggest that long-term mindset intervention can improve academic performance, but educators need to: (a) consider synergistic factors and gender differences, such as competitive tasks for boys and study groups for girls; (b) provide emotional support, especially for fixed-mindset students; (c) engage in long-term, patient intervention; (d) train teachers in mindset theory, promote collaborative teaching, and foster positive attitudes; (e) work with parents to improve intervention outcomes [59].

5.4. The Synergistic Effects of Learning Mindsets and Other Factors

In this context, a strong learning ability often relates to positive mindsets, driven by high performance and positive experiences. However, ability alone does not guarantee a growth mindset, as family upbringing and other factors influence it. Positive mindsets enhance learning outcomes even for medium-performance students by encouraging effort, proactive strategies, and help-seeking. Importantly, a positive mindset is essential—simply engaging in behaviors like help-seeking cannot change outcomes without that mindset.

5.5. Implications

This case study explores student mindsets and educator responses within a specific cultural context. Neither students nor teachers had previously engaged in in-depth mindset reflection, and systematic growth mindset interventions were missing. Future research could: (a) create intervention frameworks tailored to contexts (e.g., high-stakes testing environments) with collaboration between schools and families; (b) explore mindsets across different stages, cultural backgrounds, educational backgrounds, and educator perspectives.

6. Conclusions

This study found that A-level learners in this Chinese international education context generally demonstrated mixed rather than clearly fixed or growth mindsets. Their learning mindsets were shaped by multiple factors, particularly academic performance and the learning environment, alongside family experiences, teacher influence, previous educational experiences, peer relationships, and personal goals. The findings also suggest that mindset alone does not determine students' academic development; effort, learning strategies, and support interact with mindset in shaping learning experiences and outcomes. Teachers' perceptions and preparedness also emerged as important considerations for supporting students with diverse learning mindsets. Overall, the study highlights the importance of understanding learning mindset as a dynamic and context-dependent process. Supporting students therefore requires not only attention to their beliefs about learning, but also supportive learning environments, appropriate teaching practices, and sustained opportunities to develop effective learning strategies [60-78].

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Supplementary Material

Appendix 1: Data Collection Schedule

- ✧ 15 March 2023-17 March 2023: Questionnaire data collection
- ✧ 18 March 2023-24 March 2023: Student Interviews for 3 Fresh Group students
- ✧ 25 March 2023-31 March 2023: Student Interviews for 3 Middle Group students
- ✧ 1 April 2023-7 April 2023: Student Interviews for 3 Old Group students
- ✧ 8 April 2023-14 April 2023: Teacher Interviews for two younger teachers
- ✧ 15 April 2023-21 April 2023: Teacher Interviews for two older teachers
- ✧ 22 April 2023-30 April 2023: Teaching assistant Interviews for two tutors
- ✧ 18 March 2023-31 May 2023: Informal Observation data collection
- ✧ Exam Weeks during 18 March 2023-31 May 2023: Document data collection to check the students' academic performance
- ✧ 23 April 2025: Completion of the follow-up investigation

Appendix 2: Data Analysis

https://www.kdocs.cn/l/conion3Dyi6w

Appendix 3: Data Collecting Methods Design

(1) Questionnaire

Questionnaire

调查问卷

The purpose of this questionnaire is to gain information about learning mindsets and teacher behaviours. This questionnaire is anonymous and all the information will be protected confidentially and used for research only. 本调查问卷的目的在于获得与学习心态和教师行为的相关信息。本调查问卷采用匿名形式，所有信息将进行保密处理并只用于研究目的。

Please read the statements below carefully and choose the responses which most closely reflect your own view for the questions 1–14 and frankly respond to the open-ended questions 15–17 (you can answer these questions in English or Chinese).请认真阅读以下内容，在 1–14 题中选出最接近你的观点的答案，并坦诚地回答 15–17 题（你可以用英文或中文回答这些问题）。

Gender 性别：_____Age 年龄：_____Date 日期：_____

1. What do you think about your ability 你认为你的能力：
   A. Will be fixed 固定不变的
   B. May have some change but not too much 可能有变化但变化不大
   C. Can grow by your hard work 会因着自己的努力而增长
2. When you face challenges, what you will do 当你遇到挑战时，你会怎么做?
   A. Avoid as possible as you can since you dislike possible failure 尽量回避，不想面对失败
   B. Have a try but let it go with the flow 可以尝试，结果顺其自然
   C. Rise to the challenges and overcome the difficulties 迎接挑战，攻克难关
3. When experiencing failures, you react in which way 当你经历失败时，你作何反应：
   A. Whatever! Since I am nothing 无所谓了，反正我就这样了
   B. Be sad since I have tried my best 有点难过，下次要尽力
   C. It' s not bad since this is a good chance for my growth 没有那么糟糕，因为这是一个使我成长的机会
4. If you meet some difficult problems, how will you do 当你遇到不会解的题目时，你会怎么做?
   A. Wait for the teacher to explain 先放着，等着老师讲
   B. Take time to solve it by yourself 花时间想办法自己搞定
   C. Seek for peers' help 寻求同学的帮助

5. When your hard work don't generate the expected learning effect, what will you do 当你发现自己的努力并不能达到想要的学习效果时，你会怎么做?
   A. Work harder 更加努力
   B. Give up 放弃
   C. Change learning methods 改变学习方法
6. How do you think about the influence of family factors on your learning mindset 你认为家庭因素对学习心态的影响如何?
   A. Greatly 很大　　B. Moderately 中等　　C. Slightly 很小
7. Determine how warm is your family's ambience 选择你家庭氛围的温暖程度:
   A. not too much 不太温暖　　B. generally warm 比较温暖　　C. very warm 非常温暖
8. Choose one word to describe your parents'/guardians' parenting style towards you 选择一个词来形容你父母/监护人对你的教养方式:
   A. Control 控制　　B. Spoil 宠溺　　C. Guide 引导
9. Is there any past learning experience significantly influence your current learning mindset 过去的学习经历有没有对你现在的学习心态产生了重要影响?
   A. Yes, some negative learning experience 有，一些消极的学习经历
   B. Yes, some positive learning experience 有，一些积极的学习经历
   C. None or little 没有或很小
10. How do you think about the influence of learning environment on your learning mindset 你认为学习环境对学习心态的影响如何?
   A. Greatly 很大　　B. Moderately 中等　　C. Slightly 很小
11. How do you think about the influence of peer social activities on your learning mindset 你认为同学间的社交对学习心态的影响如何?
   A. More positive effects than negative effects 积极的影响多于消极的影响
   B. Less positive effects than negative effects 积极的影响少于消极的影响
   C. Almost the same between the both 两者差不多
12. How do you think about the influence of test or exam results on your learning mindset 你认为测验或考试成绩对学习心态的影响如何?
   A. Greatly 很大　　B. Moderately 中等　　C. Slightly 很小
13. How do you think about the influence of the academic performance comparison between peers on your learning mindset 你认为同学之间的学习表现比较对学习心态的影响如何?
   A. Greatly 很大　　B. Moderately 中等　　C. Slightly 很小
14. How do you think about the influence of the feedback from teachers on your learning mindset 你认为教师反馈对学习心态的影响如何?
   A. Greatly 很大　　B. Moderately 中等　　C. Slightly 很小
15. Please write all the teacher behaviours that play a positive role for your learning 请写出所有对你起积极作用的教师行为:

16. Please write all the teacher behaviours that play a negative role for your learning 请写出所有对你起消极作用的教师行为:

17. If you want to express any other ideas about learning mindsets and teacher behaviours, please write below freely 如果你想表达关于学习心态和教师行为的任何其他观点,请自由地写在下面:

Thanks so much for your participating 非常感谢你的参与!

(2) Semi-structured Interview Questions Design

(i). Semi-structured Interview for Students

1. What do you think about your learning mindset? Growth mindset or fixed mindset? Can you give some examples to explain?
你认为你的学习心态是固定型的还是增长型的？能举例子说明一下吗？
2. What do you think has shaped your current learning mindset? Such as family factors/ learning experience and environment/ peer sociality/ exam scores/ teacher behaviours?
你觉得是什么原因塑造了你现在的学习心态？家庭因素/学习经验与学习环境/与同学之间的关系/考试成绩/教师行为等
3. Do you think there are other factors affecting your learning mindset?
你认为还有其他因素影响的学习心态吗？
4. How these factors shape your learning mindset?
这些因素是如何影响你的学习心态的？
5. Can you talk about how teachers affect your learning?
你能谈谈老师如何影响你的学习吗？

(ii). Semi-structured Interview for Teachers

1. Could you talk about something about our students' learning mindsets?
您能谈谈咱们学生的学习心态吗？
2. What factors do you think has shaped the learners' learning mindsets?
您觉得哪些因素会影响学生的学习心态？
3. How these factors shape the learners' learning mindset?
这些因素是如何影响学生的学习心态的？
4. As for the learners with different learning mindsets, what teaching methods do you adopt?
对于不同心态的学生，您会采取哪些教学方法呢？
5. As a teacher, how do you rate yourself and why?
作为一个老师，您给自己打多少分？为什么打这个分数？
6. Do you think it is necessary to promote professional development for yourself? If yes, what kinds of internal changes and external support do you need?
您觉得自己是否有必要进行专业化发展？如果有必要，您觉得需要哪些内部转变和外部支持？

(iii). Semi-structured Interview for Teaching Assistants

1. Could you talk about something about our students' learning mindsets?
您能谈谈咱们学生的学习心态吗□
2. What factors do you think has shaped the learners' learning mindsets?
您觉得哪些因素会影响学生的学习心态？
3. How these factors shape the learners' learning mindsets?
这些因素是如何影响学生的学习心态的□
4. From the perspective of servicing the learners, could you talk about the learners' feedback to our teachers?
从维护学生的角度，您能谈谈学生对老师的反馈吗？
5. What the ideal teachers look like in your opinion?
您认为理想的教师是什么样的？
6. What kinds of internal changes and external support do you think for our teachers to become your ideal teachers?
您觉得要想成为您心中理想教师模样，我们现在的老师需要哪些内部转变和外部支持？

(3) Informal Observation Field Notes Form Design

Grade	Ability level	Subject	Gender	Date	Students' language and behaviours relative to learning mindsets
Fresh	Low	A			
	Middle	B			
	High	C			
Middle	Low	D			
	Middle	E			
	High	F			

Old	Low	G			
	Middle	H			
	High	I			