Teachers 'Competence and University International Students' Performance: Students' Willingness as Mediator

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Abstract

The pursuit of enhancing teachers' competence is essential in advancing the university international students' performance. Higher education institutions are dedicated to fostering an environment that promotes both student engagement and academic excellence, recognizing the pivotal role of teachers' competence in this process. This study delves into the impact of teachers' competence on the university international students' performance, with a focus on the mediating role of students' willingness. The research constructs a structural equation model to explore the relationships between the various teachers' competence and international students' performance

The empirical validation, involving a sample of 240 international students, confirms the proposed model, demonstrating that teachers' competence has a significant positive impact on students' academic outcomes. Furthermore, the study reveals that students' willingness to learn serves as a crucial mediator in this relationship, highlighting the importance of creating a learning environment that encourages student motivation and participation. This scholarly inquiry not only deepens our understanding of the factors influencing the academic success of international students but also provides critical insights for educational policymakers and university administrators seeking to improve teaching effectiveness and student learning experiences.

Keywords: Teachers' competence, Students' learning willingness, International Students' learning performance

Introduction

Globally, international education is a fast-increasing business with significantly more demand than supply. The key causes for the rising demand for international education include labor internationalization, a significant development in academic mobility at the higher education level, and China's growing dominance as a business language (https://sampi.co/). In the last decade, Chinese foreign education has expanded rapidly (Lei et al,2019). By 2023, there will be about 500,000 international students studying in China, with the number growing by 10% per year. China is rapidly gaining popularity as a study-abroad destination

It is uncommon for international students to encounter difficulties studying in China. When students decide to learn in a major nation such as China, they anticipate challenges similar to those others face. Chinese language learning might be difficult for international pupils. Most academics teach in Chinese. International students may take Chinese language lessons at Chinese universities, although their proficiency could be improved (Zhou, and Hans de Wit (2019). Furthermore, China's large population allows for a wide range of cultural expressions. Students must be open to differences and capable of self-adaptation (https://aljawaz.com). The fundamental issue is, what are the essential factors that students must meet to succeed in studying in China?

Instructors affect international students' learning and performance. Many studies have studied instructor competency and student learning. Most research has evaluated domestic education, but only some have assessed teachers' competence and international student performance. As the number of students studying abroad and international education has risen, so has research in this field (Li,2019; Xu,2023).

Among challenges of teaching and culture, A willingness to study leads to learning success because it boots responsibility and increases confidence for learning new skills. It helps a person's confidence, improving performance in numerous areas of life. A willingness to study was assessed by task value, which impacts empirical research task choice. Theorists use three motivational theories to characterize motivational orientations that differ in task value prediction utilizing two broad dimensions, inside and outside—internal and external motivations. Even with a controlled self-concept of competence, school inward motivational orientation is significantly linked with student adult task value. The willingness model includes motivation, future opportunities, and ability (Gorges et al., 2013; Patil & Undale, 2022; Castillo et al., 2023; Wang, 2024). Furthermore, student resilience is another factor of facing learning challenge. Resilience is the process and result of effectively adjusting to harsh or hard life situations, particularly via mental, emotional, and behavioral flexibility and adjustment to external and internal pressures

In this new environment, pupils must be resilient. Resilience is widely acknowledged as a significant trait of the BANI world, marked by brittleness, a condition where once sturdy and reliable systems have become fragile and prone to breakage (Tan, 2023). Resilience is the drive for self-actualization, compassion, knowledge, and spiritual strength. Based on resilience, surviving significant risk occurrences has a positive psychological outcome. The notion of resilience has remained constant throughout time. It refers to persons having a better result than others encountering comparable obstacles. Resilience theory investigates how people are impacted and adapt to adverse events such as adversity, change, loss, and risk. Resilience theory has been studied in many fields, including psychiatry, human development, and change management (Richardson,2002; Rutter,2013; Hurley and Young,2022).

Literature Review and Hypothesis

Definitions of Key Terms

Willingness is the attribute of being eager to accomplish something if required (https://dictionary.cambridge.org). If someone is willing, one has the attribute of willingness, which may range from "prepared" to "enthusiastic" (www.vocabulary.com). Willingness reflects a person's desire to learn new things and develop themselves. Being willing is a key psychological notion that indicates a person's preparedness, drive, and openness to change, develop or participate in particular activities. It aids behavior modification, treatment, and self-improvement (https://www.psychology-lexicon.com/). Willingness involves accepting and participating in the present. Allowing oneself to experience the emotions differs from "liking" or "wanting" them. It means accepting what is happening, even if it is difficult (https://therapyinanutshell.com/).

Gibbons and Gerrard (1995) defined *willingness* as accepting the behavior under specified circumstances. The concept can predict behavioral intentions; therefore, academia uses it (Shin et al., 2017). In education, willingness to learn is a desire to learn and grow personally and professionally. It involves being interested and actively seeking experiences that improve one's skills or knowledge (www.discover-startup.eu/).

In conclusion, willingness denotes motivation, drive, and receptivity to action, change, and personal progress (www.vocabulary.com;https://therapyinanutshell.com/; Gibbons and Gerrard,1995; Shin et al., 2017; www.discover-startup.eu/).

The modeling assumptions are shown below.

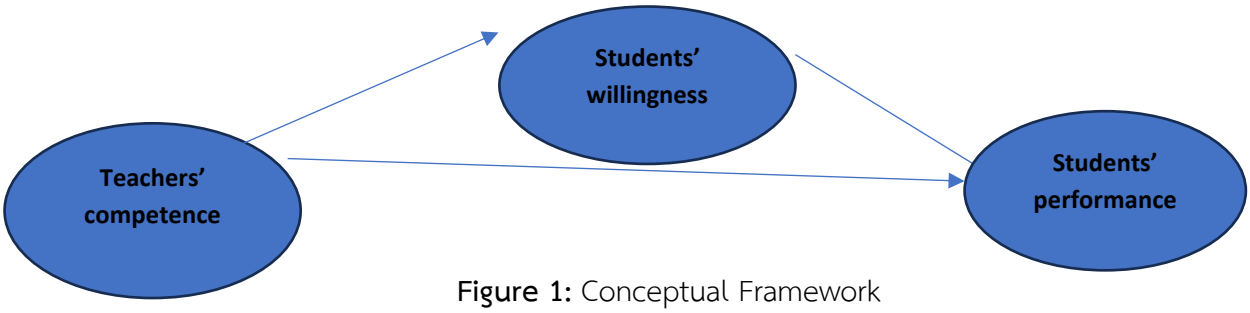

Figure 1: Conceptual Framework

Research Hypothesis

Hypothesis 1 (H1): Students' willingness mediates the relationship between teachers' competencies and students' learning performances.

Hypothesis 2 (H2): Teachers' competencies have a positive direct impact on students' learning performances.

Hypothesis 3 (H3): Students' willingness have a positive direct impact on students' learning performances

Research Methodology

This part of the researchers used a set of questionnaires to validate the model and hypotheses, Aiming to Explore the Relationship Between Teachers' Competence and

International University Students' Performance, and the mediating role of students' willingness. The finalized model will be used for data analysis and interpretation.

Pre-survey

In the pre-survey stage, 35 questionnaires were distributed. After excluding invalid questionnaires, the valid questionnaires of the pre-survey were 30, and the effective recovery rate of the samples was 85.71%. After the reliability analysis of the pre-survey, "Cronbach Alpha if Item Deleted", CITC (Corrected Item-Total Correlation), item analysis, and expression accuracy or not of the four analytical treatments, and after the expert's advice, retained 53 items, the model relationship and items are shown below figure 2.

Population and Sample

The data came from universities in the yunnan Province China, covering different majors and different grades. The questionnaires were collected online, and finally 264 responses were obtained, and after deleting invalid and incomplete questionnaires, the number of valid questionnaires was 240, with a validity rate of 90.90%.

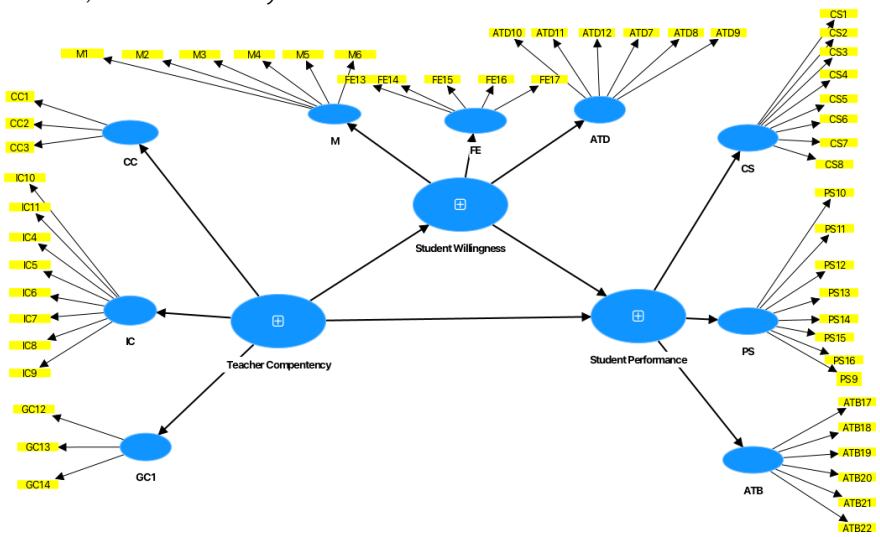

Figure 2: Model diagrams and their question items identified after the pre-survey

Instrument

Of all the scales, the study used a 5-point Likert subscale, with 5 indicating agreement and 1 indicating complete disagreement.

Table 1 Specific references to the scale sources and included question items

Variables	Abbreviations	Dimension	Abbreviations	Items	References
International Students Performance	SP	Cognitive skills	CS	1-8	Hesel (2012) Kim et al (2015) Curtis (2020) Mao et al. (2022) Han and Zhu (2022)
		Psychomotor skill	PS	9-16	
		Attributes	ATB	17-22	
Teacher competency	TC	Cognitive competence	CC	1-3	Dai and Ahmad Johari Bin Sihes (2023); Ma (2023) Wang (2023)
		Instruction competence	IC	4-11	
		Growth competence	GC	12-14	

Variables	Abbreviations	Dimension	Abbreviations	Items	References
Student's Willingness	SW	Motivation	M	1-6	Girardelli and Patel, 2015; Gilor and Katz, 2018; Demir and Akpinar (2018); Yue et al. (2020)
		Attitude	ATD	7-12	
		Future Expectation	FE	13-17	

Data source: Author's compilation based on references

Data Analysis and Results

The researcher used Hair et al.'s (2022) data analysis method to address the quantitative study objectives. The first step is to evaluate the reflective measurement model.

Indicator reliability

Indicator reliability measures or evaluates a certain indicator's dependability or trustworthiness. It is used to assess the amount of trust or accuracy that may be put on the information supplied by the indicator.

Table 2 Indicator reliability

Variable	Dimension	Item	Outer loading
International Students Performance (SP)	Cognitive Skills (CS)	CS 1	0.846
		CS 2	0.834
		CS 3	0.846
		CS 4	0.838
		CS 5	0.772
		CS 6	0.845
		CS 7	0.828
		CS 8	0.870
	Psychomotor Skill (PS)	PS9	0.825
		PS10	0.833
		PS11	0.805
		PS12	0.853
		PS13	0.833
		PS14	0.859
		PS15	0.844
		PS16	0.858
	Attributes (ATB)	ATB17	0.807
		ATB18	0.867
		ATB19	0.807
		ATB20	0.842
		ATB21	0.857
		ATB22	0.808
Teacher competency (TC)	Cognitive Competence (CC)	CC1	0.839
		CC2	0.871
		CC3	0.852
	Instruction competence (IC)	IC4	0.852
		IC5	0.833
		IC6	0.831
		IC7	0.807
		IC8	0.802
		IC9	0.859
		IC10	0.814

Variable	Dimension	Item	Outer loading
		IC11	0.873
	Growth Competence (GC)	GC12	0.893
		GC13	0.849
		GC14	0.842
Student's Willingness (SW)	Motivation (M)	M1	0.840
		M2	0.843
		M3	0.766
		M4	0.867
		M5	0.820
		M6	0.841
	Attitude (ATD)	ATD7	0.844
		ATD8	0.832
		ATD9	0.823
		ATD10	0.856
		ATD11	0.834
		ATD12	0.813
	Future Expectation (FE)	FE13	0.859
		FE14	0.830
		FE15	0.767
		FE16	0.846
		FE17	0.856

the reliability analysis for various factors associated with overseas students. In this context, reliability is defined by the measurement's consistency and stability. Based on the outer loadings, most items have high dependability (values typically over 0.80), which shows that the study's measurements are consistent and likely to capture the targeted constructs correctly.

Internal Consistency Reliability

Internal consistency reliability is a method for determining the validity of a test and each item on it. The purpose of the assessment is to ask questions that are all connected to the topic being studied.

Table 3 Convergent Validity of first-order variables

	Cronbach's alpha	(rho_a)	(rho_c)	(AVE)
SP	0.977	0.978	0.979	0.678
TC	0.964	0.964	0.967	0.679
SW	0.969	0.970	0.972	0.671

Table 3 displays the convergent validity metrics for many variables based on Cronbach's alpha (rho_a), rho_c, and Average Variance Extracted (AVE). Convergent validity evaluates how effectively the items in a measure represent the same underlying notion. These results imply that the study's metrics are likely reliable and internally consistent. The components inside each variable seem to measure the same underlying concept accurately.

Table 4 Reliability analysis of second-order variables

	Cronbach's alpha	(rho_a)	(rho_c)	(AVE)
CS	0.938	0.938	0.949	0.698
PS	0.940	0.940	0.950	0.704
ATB	0.911	0.912	0.931	0.692
cc	0.814	0.816	0.890	0.729
IC	0.937	0.938	0.948	0.696
GC	0.826	0.827	0.896	0.743
M	0.909	0.910	0.930	0.689
ATD	0.912	0.913	0.932	0.695
FE	0.888	0.889	0.918	0.692

it is reassuring to note that Cronbach's Alpha for all variables except Learning Environment (LE) and Learning Strategies (LS) is more than 0.8, a level of adequacy that instills confidence in the study's findings. The AVE for all variables is near to or greater than 0.6, showing strong convergent validity. These findings indicate that the majority of the second-order variables in the research were highly dependable, suggesting that the measurements employed to capture these variables are reliable and internally consistent.

Convergent validity

Convergent validity refers to the extent to which different models can access and quantify the same aspect of a single phenomenon or construct.

Table 5 Convergent validity analysis of first-order variables

	Factor loading	Composite reliability (rho_c)	Average variance extracted (AVE)
International Students Performance (SP)	0.949	0.979	0.678
	0.950		
	0.931		
Teacher competency (TC)	0.890	0.967	0.679
	0.948		
	0.896		
Student's Willingness (SW)	0.930	0.972	0.671
	0.932		
	0.918		
	0.890		
	0.929		

According to the table, all variables have high factor loading, composite reliability, and AVE values. This implies that the elements inside each construct are closely connected to the underlying construct and that the measurements are accurate and valid. The composite reliability (rho_c) values are all more than 0.9, showing high internal consistency among the items within each construct.

Table shows that the first-order variables have good convergent validity, which suggests that the measurements employed to evaluate these constructs are accurate and dependable.

Discriminant validity

Discriminant validity is the degree to which a test is unrelated to other tests that assess distinct constructs. The researcher used HTMT, Fornell Lucker, and cross loading for

HTMT is a statistical metric used to examine discriminant validity using latent variables or constructs in research.

Table 6 HTMT

	SP	SW	TC
SP			
SW	0.626		
TC	0.615	0.627	

The Fornell-Larcker

The Fornell-Larcker criteria is another way for determining discriminant validity in PLS-SEM. It compares a construct's average variance extracted (AVE) to the squared correlations with other constructs.

	ATB	ATD	CS	FE	GC	IC	M	PS	SP	SW	TC	cc
ATB	0.832											
ATD	0.574	0.834										
CS	0.955	0.590	0.835									
FE	0.573	0.953	0.579	0.832								
GC	0.547	0.536	0.561	0.544	0.862							
IC	0.560	0.594	0.579	0.594	0.921	0.834						
M	0.590	0.955	0.605	0.955	0.555	0.613	0.830					
PS	0.959	0.597	0.957	0.596	0.584	0.601	0.608	0.839				
SP	0.982	0.597	0.986	0.592	0.574	0.591	0.611	0.987	0.824			
SW	0.589	0.985	0.602	0.983	0.554	0.611	0.986	0.610	0.610	0.819		
TC	0.569	0.590	0.586	0.591	0.957	0.990	0.609	0.609	0.599	0.607	0.824	
cc	0.549	0.566	0.566	0.565	0.902	0.926	0.584	0.584	0.576	0.582	0.960	0.854

Evaluation of the Structural Model

Evaluating a structural model involves several key steps to assess its overall fit, the significance of relationships, and predictive power.

Assessment of Collinearity

Assessment of Collinearity ensures that independent variables are not highly correlated, as this can affect the accuracy of model estimates.

Table 7 Variance Inflation Factor (VIF) and Tolerance values

Var.	VIF	Tolerance
TC	1.742	0.574
SW	1.414	0.707

Table 7 indicates no significant collinearity among the variables TC, SW,. Both VIF and tolerance values are within acceptable ranges, suggesting that these variables are not highly

correlated with each other. This is a positive finding as multicollinearity can negatively impact statistical models.

Assess the significant and relevance of the structural model relationship

Structural evaluations are conducted to ensure that constructions meet all applicable building codes governing structural integrity. Conditions assessments seek indicators of probable structural faults or building maintenance concerns that could lead to breakdowns.

Table 8 Relevance of the structural model relationships

	SP	SW	TC	IR
SP	1			
SW	0.482***	1		
TC	0.529***	0.510***	1	

* $p<0.05$ ** $p<0.01$ *** $p<0.001$

Table 8 shows that all correlation coefficients are positive and statistically significant (***), indicating a strong positive association between all pairs of variables. The strongest correlation between TC and IR (0.592) is not just significant, but also crucial, showing a profound positive association between the two variables. The lowest correlation is between SW and IR (0.448); however, this is still a significant positive association. The table indicates a considerable interconnectivity between the variables SP, SW, and TC.

Table 9 Total indirect effects

Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
TC -> SP	0.261	0.262	0.060	4.351	0.0

From table 9 the total indirect effect of TC on SP is 0.261. This indicates that a substantial portion of the overall effect of TC on SP is mediated through the other variables in the model. The effect is statistically significant ($p < 0.001$), suggesting that the indirect relationship between TC and SP is reliable. In essence, the table shows that TC influences SP not only directly but also indirectly through its relationships with SW and IR.

Table 10 Specific indirect effects

Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
TC -> SW -> SP	0.117	0.119	0.043	2.701	0.007

From table 10 C -> SW -> SP statistically significant, which indicates that contribute to TC's overall indirect effect on SP.

Table 11 Total effects

Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
TC -> SP	0.539	0.538	0.056	9.673	0.000

From table 11 the total effect of TC on SP is 0.539, which indicates a substantial positive impact of TC on SP when considering both direct and indirect pathways. The effect, which is statistically significant ($p < 0.001$), confirms a robust and undeniable relationship between TC and SP. In essence, the table shows TC's overall influence on SP, incorporating both direct and indirect relationships.

Assess the model's Explanatory power

Explanatory power indicates the strength of the postulated causal links in a PLS path model.

Table 12 Effect Size Rating

	R-square	R-square adjusted	f^2	Effect Size Rating
SP	0.388	0.381		LOW
SW	0.265	0.262	0.060	LOW
TC			0.074	LOW

From table 12 all variables have been classified as having a low effect size. The R-squared and adjusted R-squared values indicate the proportion of variance in the dependent variable explained by the independent variables. While these values are not considered low, the effect size calculations, often based on f^2, suggest a relatively low impact of the independent variables on the dependent variable.

Assess the Model's predictive power

Predictive power refers to a predictive system's capacity to reliably foresee outcomes by partitioning the input space while balancing high accuracy and overtraining.

Table 13 Predictive relevance (Q^2)

	SSO	SSE	Q^2 (=1-SSE/SSO)
SP	3696.000	2897.313	0.216
SW	2112.000	1750.091	0.171
TC	1584.000	1584.000	0.000

Table 13 provides a quantitative assessment of how well the predictive model performs in explaining the variance of the variables SP, SW, and TC. Higher Q^2 values generally indicate better model performance. TC has a Q^2 of 0, suggesting that the model doesn't explain any of the variance in TC.

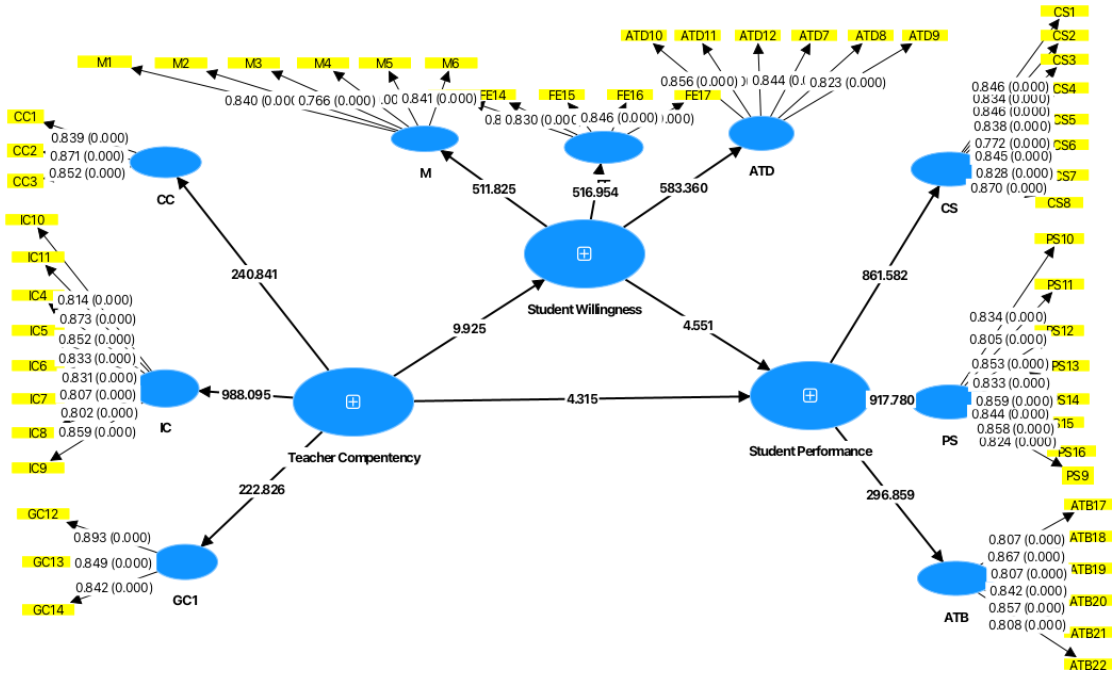

Figure 3 Path relationship

Conclusion and Discussion

Conclusion

In this study, the proposed hypotheses were thoroughly tested using quantitative analysis techniques. The results indicate a significant relationship between Teacher Competency (TC), Student Willingness (SW), and Student Performance (SP). Specifically, the analysis shows that both Teacher Competency (TC) and Instructional Competence (IC) significantly impact Student Willingness (SW), which in turn influences Student Performance (SP). Moreover, the mediating role of Student Willingness (SW) between Teacher Competency (TC) and Student Performance (SP) was confirmed, highlighting its critical role in the overall impact of teaching quality on student outcomes. Additionally, the findings emphasize that improving Teacher Competency (TC) can directly enhance Student Willingness (SW), leading to better Student Performance (SP).

The study's outcomes underscore the importance of focusing on both teacher competencies and instructional methods to foster a conducive learning environment, thereby enhancing student engagement and performance. This calls for educational institutions to prioritize professional development programs for teachers and create strategies that promote student willingness to engage, ultimately improving academic success.

Discussion

The study's results underscore the influential role of Teacher Competency and Student Willingness in shaping Student Performance. The positive impact of Teacher Competency on fostering Student Willingness highlights the importance of high-quality teaching and instructional practices in promoting student engagement and motivation. Moreover, the mediating effect of

Student Willingness signifies its pivotal role in channeling the influence of Teacher Competency onto Student Performance. These findings provide essential insights into the complex interplay between educational practices and student attitudes in driving academic success. They suggest that educational institutions should prioritize enhancing teacher skills and strategies to foster a supportive learning environment that enhances student willingness and, consequently, performance.

Limitations and Future Perspectives

While the study offers valuable insights, there remains an avenue for refinement in terms of the depth of analysis and the scope of variables considered. Expanding the sample size and incorporating more diverse educational settings could significantly enhance the generalizability of the findings. Additionally, the study's reliance on self-reported measures may introduce response bias; thus, future research should consider utilizing a mix of qualitative and quantitative data collection methods to capture a more holistic view of the factors influencing student performance.

Moreover, the contextual specificity of the study suggests the need for validation across different cultural and educational contexts to ensure the robustness of the findings. Longitudinal studies would be particularly valuable in exploring how Teacher Competency and Student Willingness evolve over time and their long-term effects on Student Performance.

Further investigations could also explore additional mediating or moderating variables, such as institutional support, peer interactions, or individual learning preferences, to uncover more nuanced insights into the mechanisms underlying student success. Comparative studies across various educational systems and student demographics might reveal a broader range of factors influencing academic performance, ultimately contributing to more effective educational interventions and policies.

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