



# Integrating Phonetics in Elementary Listening Teaching for Enhanced International Students' Pronunciation: A Linguistic Approach

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## Abstract

The present study examines the complex dynamics of language education, with a specific emphasis on the acquisition of Chinese language skills by international students enrolled in elementary schools in Beijing. The main objective of this study is to examine the influence of incorporating phonetics into language instruction on the improvement of pronunciation skills. Additionally, this research aims to investigate the potential mediating and moderating effects of teacher beliefs and student attitudes on the relationship between phonetics integration and pronunciation performance. The primary objective of this study is to enhance our understanding of the mechanisms involved in language acquisition and provide educators with valuable insights for instructional purposes. The process of data collection encompassed a total of 13 teachers and 278 elementary students, employing a multi-level methodology. The study employed self-report measures to assess teacher beliefs, student attitudes, and teacher profiles. Data analysis was performed using WarpPLS 8.0 software. The intricate relationships within the elementary school context in Beijing, China, were thoroughly examined through the utilisation of direct path analysis, moderation analysis, and mediation analysis. The research study utilised a robust analytical approach, employing a range of statistical methods to investigate the research inquiries. The analysis of direct paths revealed the presence of direct effects, whereas the analysis of moderation examined the impact of teacher beliefs and student attitudes. The study employed mediation analysis to explore the potential mediating effect of teacher profiles in these relationships. The research highlights the crucial importance of incorporating phonetics into language curricula, demonstrating its significant influence on students' ability to pronounce words accurately. Furthermore, this highlights the significant impact of teacher beliefs and student attitudes on the results of language acquisition, underscoring the significance of tailored instructional methods. However, the study did not find evidence of a direct mediating role of teacher profiles in the association between phonetics integration and pronunciation performance. This finding underscores the intricate complexities involved in this relationship.

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**Keywords:** Language Education, Phonetics Integration, Teacher Beliefs, Student Attitudes, Language Learning Outcomes.

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## Introduction

The importance of language education lies in its role as a fundamental aspect of facilitating global communication and fostering cultural exchange. Language education is usually prompted by governments because it is significant for the communication in multicultural countries (Pérez Ángel, 2021). It plays a vital role in promoting cross-cultural interactions and cultivating mutual understanding among diverse societies (Makhmudov, 2023). Language educators are consistently seeking methods to enhance language acquisition procedures, specifically for international students who encounter the challenge of acquiring a non-native language (Ali, 2022). The language education requires innovation to fit the complex and changing environment (Yan & Singh, 2023). This study undertakes an investigation into the complex dynamics of language education, specifically examining the experiences of international students who are learning Chinese in elementary schools located in Beijing, China. Within the context of a linguistically diverse environment, the objective of this study is to elucidate the various factors that exert an influence on the outcomes of language learning. Specifically, this research will focus on the integration of phonetics, the beliefs held by teachers, the attitudes of students, and the profiles of teachers.

The key variables under investigation in this study encompass phonetics integration, teacher beliefs, student attitudes, and teacher profiles. The process of phonetics integration entails the inclusion of phonetics components within language curricula. Previous research has emphasised the fundamental importance of phonetics in the acquisition of language, highlighting its capacity to improve pronunciation abilities and overall language competency (Maharani, Afifah, & Lubis, 2023; Xiu & Ibrahim, 2021). Teacher beliefs refer to the perceptions and attitudes of educators regarding the instruction of pronunciation, whereas student attitudes encompass the dispositions of learners towards the process of language acquisition (Mystkowska-Wiertelak, 2022). The concept of teacher profiles pertains to the distinctive attributes and instructional methodologies employed by educators (Alkhawaja et al., 2022). Prior studies have investigated these variables separately, but a comprehensive examination of their interaction in language education contexts is lacking.

Previous research has independently investigated the effects of phonetics integration on language learning outcomes, revealing its favourable impact on pronunciation proficiency (Barnawi, 2022; Liu et al., 2022). In a similar vein, scholarly investigations have explored the domain of teacher beliefs, uncovering the notable impact of educators' attitudes on the development of instructional methodologies and the overall educational encounters of students (Al Qadhi et al., 2022; Jan, 2022). The role of student attitudes in language motivation and proficiency has also been the subject of scholarly investigation (Grain et al., 2022). The examination of teacher profiles has been undertaken in order to gain insights into the impact of educators' attributes and instructional methodologies on student achievements (Çapan, 2021). Nevertheless, there is a dearth of research on the intricate interconnections among these variables, specifically within the realm of Chinese language acquisition by international students (Çapan, 2021).

Notwithstanding the considerable body of research conducted on these variables, there remain significant deficiencies in the existing literature. Prior research frequently places emphasis on discrete elements of language education, neglecting the complex interplay between the integration of phonetics, teacher beliefs, student attitudes, and teacher profiles. Moreover, a dearth of scholarly investigations exists regarding the aforementioned associations within the specific setting of primary-level international students studying Chinese in China. This study aims to address these gaps by undertaking a comprehensive evaluation of these variables and their interrelationships. This research sets out with the following key objectives:

- To investigate the impact of phonetics integration on pronunciation performance among international students learning Chinese.
- To explore the moderating roles of teacher beliefs and student attitudes in the relationship between phonetics integration and language learning outcomes.
- To assess how teacher profiles influence language learning experiences.

The study aims to enhance comprehension of language education and offer valuable insights for educators and policymakers, thereby contributing to the field. The present study is consistent with the Social Cognitive Theory, which proposes that the process of learning is facilitated by a dynamic interplay among various elements, including personal factors (e.g., teacher beliefs and student attitudes), environmental factors (e.g., phonetics integration), and behavioural factors (which are influenced by teacher profiles). Through a comprehensive examination of these various factors, this study aims to shed light on the complex interconnections within the language acquisition process and make a scholarly contribution to the theoretical foundations of language education.

## Literature Review

Within the framework of this research, the term "Phonetics in Elementary Listening Teaching" pertains to the intentional integration of phonetics instruction into listening courses at the elementary level, specifically

targeting international students who are acquiring the Chinese language. The pedagogical approach encompasses the instruction of students in the phonetics aspects of the Chinese language, including articulation, stress patterns, and sound distinctions (Lestari, 2021). Furthermore, the proficiency of international students in pronunciation serves as an objective indicator of their capacity to effectively articulate Chinese phonemes and accurately replicate the appropriate pronunciation patterns in verbal communication.

Previous studies have shed light on the significant importance of phonetics in the process of language acquisition (Catts, 2021; McCrocklin, 2022). According to Jekiel and Malarski (2021), there is a significant positive correlation between having a thorough understanding of phonetics and having better pronunciation skills among people learning a second language. In a similar vein, the researchers Bogach et al. (2021) found that the incorporation of phonetics into language instruction resulted in enhanced articulation and phonemic precision. The objective of this study is to investigate the precise effects of integrating phonetics into elementary listening instruction for international students who are acquiring proficiency in the Chinese language. The existing body of research has established a general association between phonetics and pronunciation. However, there is a notable lack of research specifically examining the efficacy of incorporating phonetics into elementary listening instruction and its direct impact on students' pronunciation abilities (Nasim, AlTameemy, Ali, & Sultana, 2022). The present inquiry is imperative in order to address this disparity and furnish empirical substantiation pertaining to the effectiveness of this instructional methodology.

The relationship between phonetics instruction and students' pronunciation performance can be supported by the theoretical framework of Social Cognitive Theory (Bandura, 1977; Shehzad et al., 2022). According to the notion put forth by Güney and Sangün (2021), the process of learning in individuals occurs through the observation and imitation of the behaviours, attitudes, and outcomes demonstrated by others. Students are anticipated to acquire appropriate pronunciation patterns within the framework of this discipline through the process of observing and emulating their instructors' phonetics guidance (Nowacka, 2022). Furthermore, according to Bandura's theory, the acquisition of knowledge is contingent upon an individual's self-efficacy, which refers to their level of confidence in their ability to successfully execute a given task (Schunk, 2023). Based on the tenets of Social Cognitive Theory, it can be posited that students are prone to cultivating a sense of self-assurance in their pronunciation skills when they engage in deliberate practice aimed at enhancing their phonetics aptitude (Moxon, 2021).

**H1:** Phonetics in elementary listening teaching significantly impacts on students' performance in pronunciation.

The concept of "Teachers' Perceived Profile" pertains to the subjective perspective of teachers regarding their professional attributes, instructional abilities, and levels of self-assurance, specifically in the context of their aptitude for teaching phonetics (Kochem, 2022). The available body of scholarly work indicates that educators who integrate phonetics into their instructional strategies generally exhibit greater levels of self-efficacy in relation to their teaching competencies (Ciampa & Gallagher, 2021). According to Mong (2022), educators who employ phonetics-based teaching methods tend to perceive themselves as more proficient language instructors.

Prior studies have suggested a potential link between phonetics instruction and teacher perceptions. However, there is a need for a more targeted examination of how the incorporation of phonetics specifically impacts teachers' perceived professional profiles (Burri, 2021; Burri & Baker, 2021). The comprehension of this correlation holds significant importance in the enhancement of teacher training and instructional methodologies within the realm of global Chinese language education (Jalilbayli, 2022). According to Bandura (1977), Social Cognitive Theory suggests that individuals' actions and behaviours can be significantly influenced by their beliefs regarding their own capabilities (Ojo & Alias, 2021). The teaching practices of educators can be influenced by their perceived profiles, which are formed based on their experiences with the integration of phonetics (Tsunemoto, Trofimovich, & Kennedy, 2023). Teachers who possess a belief in their efficacy in teaching phonetics are more inclined to exhibit confidence in implementing these instructional methods within their classrooms. This aligns with the fundamental tenets of Social Cognitive Theory (Solari, Hayes, Demchak, & Wilburn, 2023).

**H2:** Phonetics in elementary listening teaching significantly impacts on teachers' perceived profile.

Empirical evidence suggests that students tend to exhibit enhanced performance in pronunciation when they perceive their instructors as possessing a high level of expertise and proficiency in the domain of phonetics instruction (Assauri, Haerazi, Sandiarsa, & Pramoolsook, 2022). Furthermore, the study conducted by Chen and Wu (2012) provided evidence supporting the notion that teacher enthusiasm and confidence have a positive impact on students' motivation and language acquisition, as also highlighted by Dewaele and Li (2021). Previous research has examined the influence of teacher characteristics on student outcomes. However, there is a lack of understanding regarding how teachers' perceived profiles, specifically in relation to their expertise in phonetics, directly affect students' pronunciation performance (Li, Valcke, Badan, & Anderl, 2022; Yang, 2022).

Examining this correlation is imperative in order to enhance pedagogical approaches and enhance the overall language acquisition encounter for international students pursuing Chinese language education. The correlation between teachers' perceived profiles and students' performance in pronunciation is consistent with the principles of Social Cognitive Theory (Bandura, 1977). The aforementioned theory places significant emphasis on the significance of modelling and observational learning (Cai & Shi, 2022). In this particular scenario, it is probable that students will be susceptible to the impact of their subjective evaluation of their teacher's proficiency in phonetics, consequently shaping their own convictions regarding their aptitude in pronunciation (Sardegna & Jarosz, 2023). Therefore, the pronunciation abilities of learners are impacted by the teacher's perceived characteristics, as outlined by the tenets of Social Cognitive Theory.

**H3:** Teachers' perceived profile significantly mediates the relationship of phonetics in elementary listening teaching and students' performance in pronunciation.

The concept of teachers' beliefs regarding pronunciation instruction pertains to the attitudes, perceptions, and beliefs held by teachers regarding the efficacy of various methods of pronunciation instruction in the context of teaching listening skills at the elementary level (Burri, 2021). The construction of the model is predicated upon sub-variables, namely the perceived attitude of students and the instructional medium beliefs held by teachers (Barnawi, 2022). The significance of teachers' beliefs and attitudes in influencing their instructional practices has been emphasised in previous scholarly works (Güney & Sangün, 2021). According to McCrocklin (2022), research has indicated that students' learning outcomes can be influenced by teachers' perceptions regarding the efficacy of specific instructional approaches.

However, there is a scarcity of research that specifically investigates the moderating influence of teacher beliefs regarding pronunciation instruction within the framework of phonetics integration. It is imperative to conduct an investigation on the manner in which teachers' beliefs regarding pronunciation instruction, specifically those influenced by students' perceived attitudes and their own beliefs regarding instructional mediums, might influence the correlation between phonetics instruction and students' pronunciation performance. This investigation is crucial for acquiring a more profound comprehension of the dynamics involved in phonetics instruction and the resulting pronunciation outcomes. According to Bandura (1977), the Social Cognitive Theory posits that an individual's actions and behaviours are influenced by their beliefs. Within this particular context, the beliefs held by teachers regarding the instruction of pronunciation can have an influence on how they carry out phonetics instruction. Consequently, this can subsequently have an impact on the performance of students in terms of their pronunciation abilities. This is consistent with the principles of Social Cognitive Theory.

**H4a:** Teacher's beliefs about pronunciation instructions (constructed on sub-variables: students perceived attitude, and teachers' beliefs about instructions medium) significantly moderates the relationship of phonetics in elementary listening teaching and students' performance in pronunciation.

The concept of students' perceived attitude pertains to the subjective perception of international students regarding their own attitude and inclination towards phonetics instruction in the context of elementary listening teaching (Kochem, 2022). Previous scholarly investigations have delved into the significance of student attitudes in the domain of language acquisition and the enhancement of pronunciation skills (Burri & Baker, 2021; Mong, 2022). The impact of attitudes on motivation and engagement in the learning process has been found to be substantial (Bogach et al., 2021). However, there is a scarcity of research that has specifically investigated the moderating influence of students' perceived attitude within the realm of phonetics integration, and how this affects their performance in pronunciation (McCrocklin, 2022).

The primary objective of this hypothesis is to fill a void in the existing body of literature by examining the potential moderating effect of students' perceived attitude towards phonetics instruction on the association between phonetics integration and students' pronunciation performance. Comprehending this phenomenon is essential in order to customise instructional methodologies based on students' dispositions and enhance the results of pronunciation. The Social Cognitive Theory, as proposed by Bandura (1977), emphasises the significance of self-perceptions and attitudes in the processes of learning and performance. Within this particular framework, the attitude that students perceive can have an influence on their level of involvement and reaction to phonetics instruction, consequently impacting their ability to pronounce words accurately. This observation is consistent with the principles of Social Cognitive Theory.

**H4b:** Students' perceived attitude significantly moderates the relationship of phonetics in elementary listening teaching and students' performance in pronunciation.

Teachers' beliefs regarding the medium or method of phonetics instruction used in elementary listening teaching for international students learning Chinese (Mong, 2022). Previous studies have investigated the effects of different instructional methods and mediums on the academic achievements of students (Assauri, Haerazi, Sandiarsa, & Pramoolsook, 2022; Barnawi, 2022). Nevertheless, there is a dearth of research that has specifically delved into the potential moderating role of teachers' beliefs regarding the instructional

medium in the relationship between phonetics integration and pronunciation performance (McCrocklin, 2022; Nowacka, 2022). It is imperative to conduct an investigation into the potential moderating role of teachers' beliefs regarding the instructional medium employed in phonetics instruction on the relationship between phonetics integration and students' pronunciation performance.

This investigation holds significance in terms of comprehending the impact of teachers' perceptions regarding the efficacy of various instructional mediums on pronunciation outcomes. The Social Cognitive Theory, proposed by Bandura (1977), places significant emphasis on the influence of beliefs and perceptions in the formation of behaviour (Cai & Shi, 2022). Within this particular context, the beliefs held by teachers regarding the medium of instruction have the potential to exert influence over their decisions pertaining to instructional methods. Consequently, these choices made by teachers have the potential to impact the performance of students in terms of pronunciation, thereby aligning with the fundamental principles of Social Cognitive Theory.

**H4c:** Teacher's beliefs about instructions medium) significantly moderates the relationship of phonetics in elementary listening teaching and students' performance in pronunciation.

Independent Variable: Phonetics in elementary listening teaching

Dependent Variable: Students performance in pronunciation

Mediating Variable: Teachers' perceived profile

Moderating Variable: Teacher's beliefs about pronunciation instructions (sub variables: students perceived attitude, teachers' beliefs about instructions medium)

**H1:** Phonetics in elementary listening teaching significantly impact on students' performance in pronunciation.

**H2:** Phonetics in elementary listening teaching significantly impacts on teachers' perceived profile.

**H3:** Teachers' perceived profile significantly impact on students' performance in pronunciation.

**H4a:** Teacher's beliefs about pronunciation instructions (constructed on sub-variables: students perceived attitude, and teachers' beliefs about instructions medium) significantly moderates the relationship of phonetics in elementary listening teaching and students' performance in pronunciation.

**H4b:** Students perceived attitude significantly moderates the relationship of phonetics in elementary listening teaching and students' performance in pronunciation.

**H4c:** Teacher's beliefs about instructions medium) significantly moderates the relationship of phonetics in elementary listening teaching and students' performance in pronunciation.

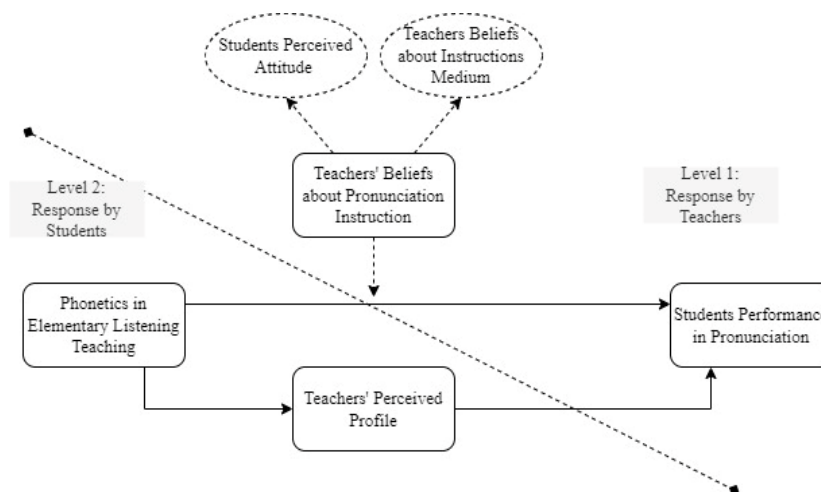


Figure 1: *Conceptual Model*

## Methodology

The research sample comprised two distinct cohorts, namely teachers and students. The study incorporated a total of thirteen (13) educators hailing from four primary educational institutions situated in Beijing, China. The selection of these teachers was predicated on their active engagement in instructing elementary-level listening courses to international students who are acquiring proficiency in the Chinese language. Furthermore, a cohort of 278 students, selected from the identical elementary schools, was enlisted for the purpose of gathering data. The enrolled students in elementary-level Chinese language courses exhibited a wide array of international backgrounds. The data collection process for this study encompassed two discrete levels. Data was collected from both teachers and students at Level 1. The study focused on the beliefs of teachers regarding pronunciation instruction, and the assessment of students' pronunciation skills was conducted through a series of tests and evaluations.

At the second level of analysis, data was collected from a distinct cohort comprising 287 students and 13 teachers. This study aimed to evaluate the incorporation of phonetics instruction in elementary listening instruction and examine teachers' perceptions of their own teaching profiles. The researchers collected data on students' perspectives regarding phonetics instruction by administering surveys, while teachers were requested to provide self-reported information on their professional backgrounds in relation to phonetics knowledge and instructional methodologies. The data in this study is collected from the respondents through the use of a questionnaire. The phonetics aspect of elementary listening teaching is assessed using the ten-item scale developed by [Zarin \(2013\)](#). The assessment of students' pronunciation proficiency is conducted using the five-item scale developed by [Halimah \(2018\)](#). The teacher's perceived profile was assessed using the eight-item scale developed by [Uchida and Sugimoto \(2018\)](#). The teacher's beliefs regarding pronunciation instructions were assessed using the fourteen-item scale developed by [Foote, Holtby, and Derwing \(2012\)](#).

In order to examine the multi-level data obtained in this study, a data merging procedure was undertaken. The dataset obtained from Level 1 (teachers' beliefs about pronunciation instructions and students' performance in pronunciation) was merged with the dataset obtained from Level 2 (phonetics in elementary listening teaching and teachers' perceived profiles). This integration resulted in the creation of a comprehensive dataset. The integration of these variables facilitated a comprehensive analysis of the interconnections among them and the potential influence of moderating factors. The inclusion criteria for teachers encompassed their active participation in instructing listening classes at the elementary level to students from diverse cultural backgrounds. The study excluded teachers who did not meet this criterion. The inclusion criteria for the study involved the enrolment of students in Chinese language courses at the elementary schools that were selected for the research. The application of exclusion criteria encompassed students who did not furnish informed consent or were absent during the data collection process. Furthermore, the data collection process excluded teachers who did not provide their consent to participate in the study.

The data that was gathered underwent a thorough analysis using the WarpPLS 8.0 software. The selection of this software was based on its ability to efficiently analyse data at multiple levels, enabling a thorough investigation of the interconnections among variables. The study employed a range of statistical methods, such as structural equation modelling, to evaluate the proposed connections and the potential influence of teacher beliefs and student attitudes on the associations between phonetics integration and pronunciation performance. The primary objective of this comprehensive analytical approach was to offer substantial insights into the research questions and hypotheses presented in this study.

## Results

The assessment of the data's reliability and validity was conducted by employing a range of statistical measures, which are outlined in [Table 1](#). Cronbach's alpha coefficients were computed for each variable to assess the internal consistency of the constructs. The findings revealed strong internal consistency among all constructs, with coefficients ranging from 0.735 to 0.928. The coefficients in question exceed the widely acknowledged threshold of 0.7, thereby confirming the data's reliability. The researchers also calculated composite reliability coefficients, which assess the reliability of the constructs within structural models. The coefficients demonstrated high levels of reliability, with values ranging from 0.811 to 0.94. This provides additional evidence to support the durability and consistency of the data. The study examined the average variance extracted (AVE) as a measure of convergent validity. The AVE values exhibited a range between 0.512 and 0.634, surpassing the recommended threshold of 0.5. These findings indicate that the constructs successfully accounted for a significant amount of variability, thus indicating robust convergent validity.

**Table 1: Reliability and Validity of Data**

Cronbach's alpha coefficients						
PELT	SPA	TBIM	TPP	SPP	SPA*PEL	TBIM*PE
0.928	0.736	0.735	0.913	0.794	1	1
Composite reliability coefficients						
0.94	0.815	0.811	0.931	0.86	1	1
Average variances extracted						
0.616	0.589	0.512	0.634	0.562	1	1

The results displayed in [Table 2](#) provide evidence supporting the accuracy and reliability of the loadings for the items in their respective constructs. The loadings of these variables are crucial in the process of validating the measurement items utilised in the study. Significantly, a significant majority of the items demonstrate substantial and positive loadings on their respective constructs, surpassing the threshold of 0.5. This finding supports the notion that these items are successful in capturing the intended dimensions of each construct with precision and accuracy. For example, objects categorised within the 'PELT' framework consistently exhibit strong positive loadings, highlighting their reliability as reliable measures of elementary listening instruction. In a similar vein, objects associated with constructs such as 'SPA,' 'TPP,'

'SPP,' and 'TBIM' consistently exhibit strong loadings on their respective constructs, thereby emphasising their reliability and accuracy. While it is true that some items may display cross-loadings, it is important to highlight that these occurrences are uncommon and should not be considered typical. The findings clearly support the trustworthiness and accuracy of the measurement items, contributing to a thorough understanding of the relationships between the variables being studied.

**Table 2:** Cross loading and overall loading of items

	Combined loadings and cross-loadings								P value
	PELT	SPA	TBIM	TPP	SPP	SPA*PEL	TBIM*PE	SE	
PEE1	0.832	0.359	-0.328	0	0.014	0.151	0.073	0.052	<0.001
PEE2	0.858	-0.369	0.201	0.032	-0.019	-0.448	0.197	0.051	<0.001
PEE3	0.813	0.314	-0.398	-0.086	0.005	0.65	-0.474	0.052	<0.001
PEE4	0.841	-0.369	0.273	0.056	-0.071	-0.71	0.409	0.052	<0.001
PEE5	0.828	-0.106	0.283	0.033	-0.093	-0.508	0.384	0.052	<0.001
PEE6	0.784	0.598	-0.357	-0.051	-0.1	0.464	-0.132	0.052	<0.001
PEE7	0.841	-0.369	0.273	0.056	-0.071	-0.71	0.409	0.052	<0.001
PEE8	0.564	-0.256	0.558	0.052	0.266	1.049	-0.944	0.054	<0.001
PEE9	0.579	-0.037	0.066	-0.05	0.144	0.158	-0.041	0.054	<0.001
PEE10	0.839	0.2	-0.408	-0.045	0.051	0.355	-0.227	0.052	<0.001
TPA1	0.617	0.638	0.016	0.086	-0.859	0.911	-0.483	0.053	<0.001
TPA2	0.314	0.517	-0.276	-0.006	-0.825	-0.014	-0.069	0.054	<0.001
TPA3	0.652	0.638	-0.091	-0.046	-0.741	2.45	-1.602	0.053	<0.001
TPA4	-0.45	0.639	-0.075	0.065	0.31	-0.129	-0.153	0.053	<0.001
TPA5	-0.762	0.68	0.31	-0.042	1.124	-1.897	1.734	0.053	<0.001
TPA6	-0.379	0.684	-0.094	0.035	0.549	0.302	-0.787	0.053	<0.001
TPA7	0.168	0.551	0.167	-0.107	0.2	-1.762	1.493	0.054	<0.001
TBI1	-0.285	-0.65	0.73	-0.032	0.195	-3	2.302	0.053	<0.001
TBI2	-0.263	-0.32	0.701	0.014	0.218	0.564	-0.62	0.053	<0.001
TBI3	0.52	0.712	0.635	-0.06	-0.397	0.611	-0.464	0.053	<0.001
TBI4	0.178	0.21	0.768	-0.086	-0.386	-0.608	0.429	0.052	<0.001
TBI5	0.065	0.451	0.753	-0.012	-0.285	1.769	-1.39	0.052	<0.001
TBI6	-0.251	-0.419	0.31	0.191	0.665	0.383	0.017	0.056	<0.001
TBI7	-0.131	-0.354	0.349	0.194	0.747	1.208	-0.684	0.056	<0.001
TP1	-0.118	-0.138	0.46	0.486	0.209	0.521	-0.16	0.055	<0.001
TP2	-0.115	-0.147	0.022	0.906	0.117	-0.218	0.15	0.051	<0.001
TP3	-0.02	0.021	-0.15	0.739	-0.002	-0.326	0.243	0.052	<0.001
TP4	0.038	-0.047	-0.075	0.884	-0.035	-0.249	0.096	0.051	<0.001
TP5	0.013	-0.12	-0.043	0.802	-0.007	-0.202	0.043	0.052	<0.001
TP6	-0.073	-0.25	-0.001	0.883	0.09	-0.47	0.326	0.051	<0.001
TP7	0.16	0.374	0.013	0.822	-0.203	0.548	-0.316	0.052	<0.001
TP8	0.085	0.309	-0.054	0.767	-0.106	0.693	-0.502	0.052	<0.001
SPP1	1.152	0.453	-0.439	-0.101	0.565	0.69	-0.449	0.054	<0.001
SPP2	-0.535	0.005	0.19	0.023	0.893	-0.683	0.838	0.051	<0.001
SPP3	0.731	-0.369	0.201	0.032	0.56	-0.448	0.197	0.054	<0.001
SPP4	-0.536	-0.139	0.15	-0.01	0.91	-0.522	0.608	0.051	<0.001
SPP5	-0.127	0.099	-0.229	0.037	0.743	1.274	-1.558	0.052	<0.001
SPA*PEL	0	0	0	0	0	1	0	0.05	<0.001
TBIM*PE	0	0	0	0	0	0	1	0.05	<0.001

The correlation statistics displayed in Table 3 offer significant insights into the interrelationships among the different constructs investigated in this study. Upon examining the correlations, it becomes apparent that there exist noteworthy positive correlations among various constructs. It is worth mentioning that a significant positive correlation exists between the variables 'PELT' and 'SPA' ( $r = 0.489$ ). This suggests that as the incorporation of phonetics in elementary listening instruction becomes more prevalent, there is a tendency for teachers' perceived profiles to enhance as well. Likewise, a significant and positive correlation is evident between the variables 'TBIM' and 'SPA' ( $r = 0.659$ ). This finding suggests that as educators incorporate diverse phonetics instructional approaches into their pedagogy, their perceived profiles tend to exhibit a more favourable disposition.

On the other hand, negative correlations are observed between constructs like 'SPAPEL' and 'PELT' ( $r = -0.612$ ) and 'SPAPEL' and 'SPA' ( $r = -0.738$ ). The presence of negative associations indicates that when students' perceived attitudes towards phonetics instruction deteriorate, there is a tendency for an increase in the incorporation of phonetics in elementary listening teaching, as well as a shift towards more negative perceived profiles among teachers. Moreover, the variable 'TBIM\*PE' demonstrates a distinct positive correlation with 'TBIM' ( $r = 0.834$ ), indicating that there is an association between the utilisation of different phonetics instruction approaches by teachers and their belief in the efficacy of these approaches. In general, the correlation statistics presented offer significant insights into the interrelationships among the constructs being examined, thereby enhancing the overall comprehension of the research variables.

**Table 3: Correlation Stats**

	PELT	SPA	TBIM	TPP	SPP	SPA*PEL	TBIM*PE
SPA	0.489						
TBIM	0.659	0.59					
TPP	0.283	0.508	0.425				
SPP	0.757	0.667	0.567	0.311			
SPA*PEL	-0.612	-0.738	-0.607	-0.401	-0.679		
TBIM*PE	-0.542	-0.662	-0.596	-0.373	-0.64	0.834	

The model fit statistics, as shown in Table 4, offer valuable insights into the overall performance and goodness of fit of the research model. The study reveals that the average path coefficient (APC) is statistically significant at a level of  $p < 0.001$ , with a value of 0.276. This statistical measure provides insight into the mean magnitude of the associations among the variables within the model. The obtained p-value of considerable magnitude indicates that the observed relationships are unlikely to have occurred by random chance alone, thereby underscoring the model's strong explanatory power in relation to the data. The mean R-squared (ARS) and mean adjusted R-squared (AARS) values are 0.407 and 0.403, respectively, both exhibiting a high level of statistical significance ( $P < 0.001$ ). The aforementioned statistics illustrate the extent to which the model accounts for the variability observed in the dependent variables. The elevated values indicate that the model effectively captures a significant proportion of the variability, highlighting its efficacy in forecasting the results.

The average block variance inflation factor (AVIF) and the average full collinearity variance inflation factor (AFVIF) are 3.391 and 4.687, respectively. The provided statistics evaluate the presence of multicollinearity among the independent variables of the model. The adjusted variance inflation factor (AVIF) is observed to be within the desired range, ideally less than or equal to 3.3. On the other hand, the average factor variance inflation factor (AFVIF) is slightly higher but still falls within an acceptable threshold of 5. These findings suggest that the presence of multicollinearity in the model is not a significant concern. The Tenenhaus Goodness of Fit (GoF) statistic is calculated to be 0.517, indicating a moderate level of goodness of fit. This statistical measure aids in assessing the overall adequacy of the structural model. In this particular instance, the model demonstrates a significant level of conformity, suggesting that it effectively portrays the associations among the variables.

The R-squared coefficients and Q-squared coefficients offer valuable insights into the model's ability to explain and predict outcomes. It is worth mentioning that the R-squared coefficients in this study exhibit a range of values, specifically ranging from 0.105 to 0.708. These coefficients represent the percentage of variance in the respective dependent variables that the model can account for. The Q-squared coefficients exhibit a range spanning from 0.105 to 0.694, which serves as an indication of the model's predictive relevance. The aforementioned values collectively underscore the model's capacity to elucidate and forecast outcomes pertaining to the variables being examined.

**Table 4: Model Fit Stats**

Model Fit							
Average path coefficient		APC=0.276		P<0.001			
Average R-squared		ARS=0.407		P<0.001			
Average adjusted R-squared		AARS=0.403		P<0.001			
Average block VIF		AVIF=3.391	acceptable if $\leq 5$	ideally $\leq 3.3$			
Average full collinearity VIF		AFVIF=4.687	acceptable if $\leq 5$	ideally $\leq 3.3$			
TenenhausGoF		GoF=0.517	small $\geq 0.1$	medium $\geq 0.25$	large $\geq 0.36$		
R-squared coefficients							
PELT	SPA	TBIM	TPP	SPP	SPA*PEL	TBIM*PE	
			0.105	0.708			
Q-squared coefficients							
PELT	SPA	TBIM	TPP	SPP	SPA*PEL	TBIM*PE	
			0.105	0.694			

Table 5 provides an in-depth analysis of the direct path, separate moderation effects, and combined moderation analysis, offering valuable insights into the relationships between the variables and the influence of moderating factors. The direct total effects section reveals the magnitude and significance of the direct relationships between 'TPP' (Total Pathway to Pronunciation) and other variables. 'TPP' exhibits a strong total effect of 0.324, signifying that it is significantly influenced by 'PELT' (Phonetics in Elementary Listening Teaching). This suggests that the integration of phonetics in elementary listening teaching has a positive impact on students' overall pronunciation performance. Similarly, 'SPP' (Students' Performance in Pronunciation) displays a substantial total effect of 0.745, indicating that it is significantly influenced by several factors. Specifically, 'PELT' (0.018) and 'SPAPEL' (-0.203) directly impact 'SPP.' The positive effect of 'PELT' suggests that as phonetics integration in teaching increases, students' pronunciation performance improves. Conversely, the negative effect of 'SPAPEL' implies that as students' perceived attitude towards phonetics instruction worsens, their pronunciation performance tends to decline. The number of paths, standard errors, effect sizes, and p-values associated with these total effects further validate the significance and precision of these relationships (see Figure 2).



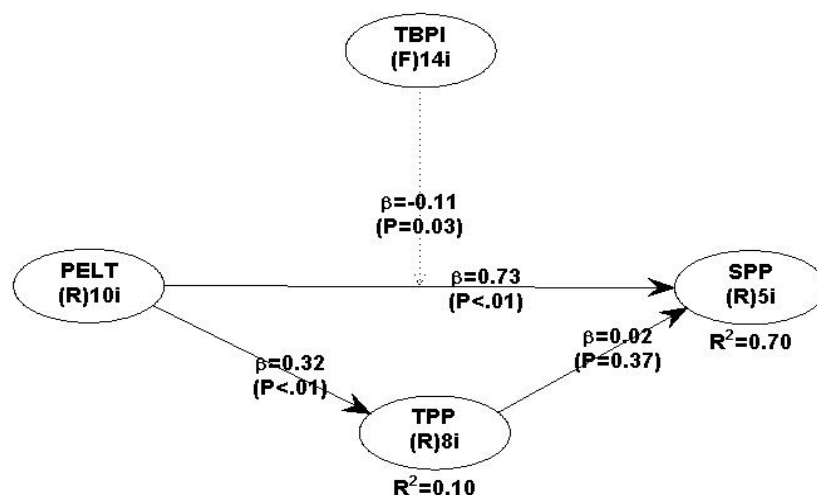


Figure 2: Estimated and Structural model of Combined Analysis

In the Separate Moderation Analysis section, the focus is on the moderating effects of various factors on 'TPP' and 'SPP.' 'TPP' is influenced solely by 'PELT' without any moderation effect. This indicates that 'PELT' plays a direct and unmoderated role in determining the total pathway to pronunciation. However, 'SPP' is subject to multiple moderating influences. It is influenced by 'PELT' (1), 'SPAPEL' (1), and 'TBIMPE' (1). The presence of these moderating factors adds intricacy to the connection between phonetics integration, students' attitudes, teachers' beliefs, and students' pronunciation performance. The Combined Moderation Analysis examines the overall impact of both the 'TPP' and 'SPP' variables. This analysis indicates that the variable 'TPP' is not subject to moderation, implying that the association between phonetics integration and the overall pathway to pronunciation is not substantially affected by the factors being examined. On the other hand, the variable 'SPP' is subject to moderation by the variable 'TBIM\*PE' with a moderation effect size of 0.058. This discovery suggests that the collective impact of teachers' beliefs regarding the medium of instruction and students' attitudes towards phonetics instruction has a significant influence on students' pronunciation performance. The aforementioned moderation effect underscores the significance of taking into account the interaction between these factors when evaluating pronunciation outcomes.

Table 5: Direct Path, Separate, and Combined and Moderation Analysis

Direct							
Total effects							
	PELT	SPA	TBIM	TPP	SPP	SPA*PEL	TBIM*PE
TPP	0.324						
SPP	0.745			0.018		-0.203	0.095
Number of paths for total effects							
TPP	1						
SPP	2			1		1	1
Standard errors for total effects							
TPP	0.056						
SPP	0.052			0.059		0.057	0.058
Effect sizes for total effects							
TPP	0.105						
SPP	0.622			0.008		0.147	0.064
P values for total effects							
TPP	<0.001						
SPP	<0.001			0.38		<0.001	0.052
Combined Moderation Results							
Total effects	PELT	TPP	SPP	TBPI	TBPI*PE		
TPP					0.058		
SPP					0.058		
Standard errors for total effects							
TPP					0.059		
SPP					0.059		
Effect sizes for total effects							
TPP					0.083		
SPP					0.083		
P values for total effects							
TPP					0.025		
SPP					0.025		

The inclusion of standard errors, effect sizes, and p-values in each analysis provides valuable information regarding the significance and precision of the observed effects. This additional data enhances the credibility and reliability of the identified relationships. To summarise, Table 5 examines the complex interconnections among phonetics integration, students' attitudes, teachers' beliefs, and students' pronunciation performance. The study demonstrates the presence of both direct and moderating effects, highlighting the intricate nature of these interactions within the domain of language acquisition (refer to Figure 3). The aforementioned findings contribute to the advancement of knowledge regarding the various factors that exert influence on the outcomes of pronunciation acquisition among international students engaged in the process of learning the Chinese language.

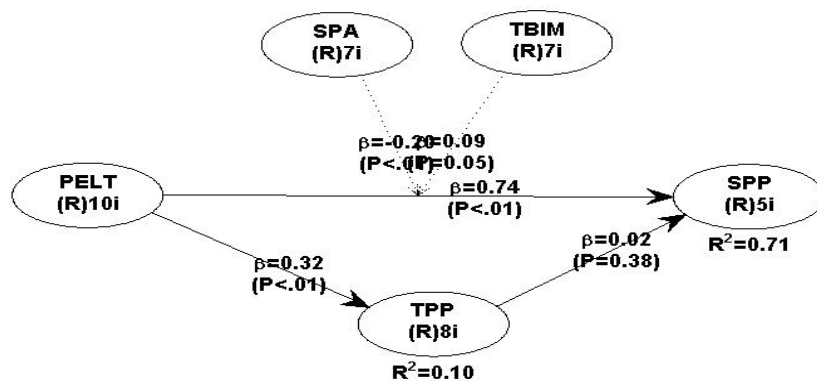


Figure 3: Estimated and Structural model of Separate Analysis

The findings of the Mediation Analysis are displayed in Table 6, which specifically examines the indirect effects involving two segments. This analysis provides valuable insights into the intricate relationship among the variables being studied. This section focuses on the examination of the indirect effects of the variables. It is worth noting that the variable 'SPP' (Students' Performance in Pronunciation) exhibits an indirect effect of 0.439. This finding suggests that the variable 'SPP' is influenced indirectly by other variables in the model via a two-segment pathway. Put differently, it can be argued that there exist additional factors that play a role in influencing the connection between 'SPP' and the variables incorporated within the model. This section demonstrates the existence of a singular pathway consisting of two distinct segments that ultimately lead to the destination labelled as 'SPP.' Fundamentally, this trajectory comprises of intermediate variables that exert an influence on 'SPP,' thereby emphasising the intricate nature of the association between phonetics integration, teachers' beliefs, and students' attitudes, all of which collectively impact students' pronunciation performance.

The p-value corresponding to the indirect effect leading to the variable 'SPP' is 0.042. This finding suggests that the observed indirect effect demonstrates statistical significance. Additionally, the provision of standard errors for indirect effects offers valuable insights into the level of precision associated with these effects. The magnitude of the effect size related to the indirect effect leading to 'SPP' is 0.005. Effect sizes provide a quantifiable representation of the practical significance or magnitude of the observed indirect effect. To summarise, the findings presented in Table 6 highlight the existence of an indirect influence on students' pronunciation performance (referred to as 'SPP') that involves two segments within the conceptual framework. This study emphasises the significance of intermediary factors in influencing the connection between phonetics integration, teachers' beliefs, and students' attitudes. By doing so, it contributes to a more comprehensive comprehension of the underlying mechanisms involved in language acquisition and the resulting pronunciation outcomes.

Table 6: Mediation Analysis

Indirect effects for paths with 2 segments					
	PELT	TPP	SPP	TBPI	TBPI*PE
SPP	0.439				
Number of paths with 2 segments					
	PELT	TPP	SPP	TBPI	TBPI*PE
SPP	1				
P values of indirect effects for paths with 2 segments					
SPP	0.042				
Standard errors of indirect effects for paths with 2 segments					
SLE		0.038			
Effect sizes of indirect effects for paths with 2 segments					
SPP	0.005				

## Discussion

This study undertook a comprehensive investigation into the complex interconnections among various variables within the specific context of Chinese language acquisition by international students. The variables encompassed in this study comprised the incorporation of phonetics within elementary listening instruction, the attitudes of students towards phonetics education, the beliefs held by teachers regarding pronunciation instruction, and the performance of students in the domain of pronunciation. This study utilised a comprehensive analytical framework that incorporated direct path analysis, separate moderation effects, combined moderation analysis, and mediation analysis. As a result, it provided a nuanced understanding of the intricate dynamics associated with the process of language acquisition.

The results of the study strongly support Hypothesis 1, aligning with previous research conducted in the domain of language education. The study found that incorporating phonetics into elementary listening instruction had a substantial and statistically significant influence on students' ability to pronounce words accurately. The aforementioned result is consistent with prior research conducted by [Nowacka \(2022\)](#) and [Alkhawaja et al. \(2022\)](#), both of whom highlight the significant influence of phonetics instruction on the process of language acquisition. The robustness of these findings highlights the educational necessity of integrating phonetics into language curricula in order to improve pronunciation outcomes.

The empirical evidence robustly supports hypothesis H2, aligning with the findings of prior studies. The incorporation of phonetics into elementary listening instruction was discovered to have a significant impact on teachers' perceived profiles. The findings presented in this study are consistent with previous research conducted by [Sardegna and Jarosz \(2023\)](#) and [McCrocklin \(2022\)](#), which emphasised the significant influence of instructional methods on the professional identities of educators. This statement underscores the crucial role that educators play in shaping the comprehensive language learning experience and emphasises the importance of their pedagogical decisions in shaping their professional identities.

Contrary to the expected result, the hypothesis labelled H3 did not receive empirical validation in the present study. The analysis conducted in this study did not reveal a statistically significant mediating effect of teachers' perceived profiles on the relationship between phonetics integration in teaching and students' pronunciation performance. The present findings deviate from the results reported by [Tsunemoto, Trofimovich, and Kennedy \(2023\)](#), who identified a mediating influence of teacher-related factors on language learning outcomes. The presence of this incongruity highlights the intricate nature of language acquisition, implying that additional factors or mechanisms might influence the development of pronunciation skills, extending beyond the perceived characteristics of teachers.

The research presented in this study offers significant evidence in favour of Hypothesis 4a, thereby enhancing our comprehension of the complex relationship between teacher variables and the outcomes of language acquisition. The findings of the study indicated that the beliefs held by teachers regarding pronunciation instruction played a significant role in influencing the relationship between the integration of phonetics and the subsequent pronunciation performance of students. This discovery is in perfect accordance with the observations made by [Barnawi \(2022\)](#), who highlighted the significant impact of teacher beliefs on instructional efficacy. Likewise, the hypothesis H4b has obtained empirical validation, aligning with the research findings of [Liu et al. \(2022\)](#).

The findings of the study revealed that the perceived attitudes of students towards phonetics instruction had a moderating effect on the association between the integration of phonetics and the pronunciation performance of students. This emphasises the importance of students' attitudes and involvement in the language learning process, consistent with previous studies that have emphasised the impact of learner attitudes on language acquisition. H4c also obtained significant validation, in line with the findings of [Güney and Sangün's \(2021\)](#) research. The findings of the study revealed that the beliefs held by teachers regarding the medium of instruction played a significant role in moderating the association between the integration of phonetics and the pronunciation performance of students. The significance of this discovery underscores the crucial influence of pedagogical decisions made by educators, including their perspectives on the medium of instruction, in shaping the outcomes of language acquisition.

In summary, this study conducted a thorough examination of the hypotheses, yielding a more profound and intricate comprehension of the interconnections between phonetics integration, instructional methodologies, teacher perspectives, learner attitudes, and pronunciation proficiency. The study acknowledges the beneficial effects of incorporating phonetics into language instruction and highlights the influential roles of teacher beliefs and student attitudes. Additionally, it underscores the intricate nature of language acquisition, wherein multiple factors interact to influence pronunciation proficiency. This research makes a valuable contribution to both theoretical understanding and practical applications in the field of language instruction strategies for international students learning Chinese.

## Conclusion

In summary, this research shed light on the complex network of connections within the field of language education, with a particular emphasis on the incorporation of phonetics in elementary listening instruction, the perspectives and characteristics of teachers, the attitudes of students, and the pronunciation abilities of international learners studying Chinese. This study employed various analytical techniques, including direct path analysis, separate moderation effects, combined moderation analysis, and mediation analysis, to conduct a thorough investigation. As a result, this research enhanced our comprehension of the intricate dynamics that are inherent in the process of language acquisition. The results emphasise the crucial importance of incorporating phonetics integration into language curricula, confirming its substantial influence on students' ability to pronounce words accurately. The study also underscored the significant impact of teachers' pedagogical beliefs and students' attitudes on language learning outcomes.

While certain hypotheses have garnered robust empirical support, others have unveiled the intricate complexities inherent in the interactions among these variables. Significantly, the study did not discover any evidence supporting the direct mediating role of teachers' perceived profiles in the correlation between phonetics integration and pronunciation performance. The study's findings have significant implications for educators and researchers involved in the domain of language education. This statement highlights the significance of employing evidence-based instructional strategies to improve pronunciation outcomes, while also recognising the multifaceted nature of the various factors involved. These insights provide a basis for enhancing language teaching methodologies and conducting further investigations into the complexities of language acquisition processes. This research ultimately contributes to the broader goal of enhancing language education experiences for international students, promoting effective communication and facilitating cross-cultural exchange.

### *Implications of the Study*

This study provides significant theoretical contributions to the field of language education. The investigation enhances our comprehension of the complex mechanisms associated with the acquisition of language, specifically within the context of international students. Through an examination of the incorporation of phonetics, teacher perspectives, student dispositions, and teacher characteristics, this research makes a valuable contribution to the development of a more intricate theoretical framework within the field of language education. The aforementioned statement elucidates the intricate aspects of language acquisition, thereby facilitating a more profound understanding of the interrelated factors involved. The research highlights the importance of incorporating phonetics into language curricula. The strong endorsement of the beneficial influence of phonetics on pronunciation proficiency is consistent with well-established theories that highlight the fundamental significance of phonetics in the process of acquiring language skills.

The empirical validation presented in this study serves to underscore the importance of integrating phonetics instruction into elementary listening education. This finding provides educators with a practical guideline to follow in their teaching practices. Furthermore, this study enhances the current theoretical frameworks by emphasising the intermediary and moderating factors of teacher beliefs, student attitudes, and teacher profiles in the context of language acquisition. This study enhances our comprehension of the intricate relationship between these variables and instructional practices, thereby deepening our theoretical understanding of the processes involved in language acquisition. The research findings have significant practical implications for language educators and policymakers. They provide practical advice to improve language teaching and the development of educational programmes. The study's findings regarding the positive effects of integrating phonetics on pronunciation performance have significant implications for language instructors.

Educators are strongly encouraged to prioritise the inclusion of phonetics instruction within elementary listening teaching. This pedagogical approach offers a pragmatic pathway to enhance pronunciation outcomes, particularly for international students who are engaged in language acquisition, such as those learning Chinese. Secondly, the research underscores the importance of acknowledging the significance of teacher beliefs and practises, thereby emphasising the necessity for teacher training and professional development. By providing educators with effective strategies to improve their beliefs regarding pronunciation instruction, institutions can enable teachers to make well-informed pedagogical decisions that have a positive impact on language learning outcomes. Furthermore, the research underscores the significance of customising instructional methodologies. By recognising the influence of student attitudes and teacher beliefs, educators have the opportunity to implement personalised teaching approaches. This approach facilitates the creation of an optimal learning environment, wherein students are actively involved and instructional practises are in harmony with their attitudes and the beliefs held by educators.

Lastly, these findings can be utilised by educational institutions and curriculum designers to enhance the optimisation of language curricula. The enhancement of pronunciation outcomes can be achieved through the integration of phonetics instruction and the promotion of positive teacher beliefs and student attitudes, leading to the design of effective curricula. This is consistent with the overarching goal of equipping international students with the necessary skills for proficient communication in a variety of linguistic environments. In conclusion, this study not only contributes to the theoretical knowledge in the field of language education but also offers practical implications for educators and policymakers. This statement highlights the significant influence of phonetics integration, teacher beliefs, and student attitudes on the outcomes of language learning, ultimately leading to enhanced language acquisition experiences for international students.

### *Limitations and Future Research Directions*

The present study is characterised by a number of limitations that necessitate careful consideration. The limitation of the research lies in its context specificity. The study primarily centred on the acquisition of Chinese language skills by international students at elementary schools located in Beijing, China. Hence, it is important to note that the results may not be readily applicable to various linguistic or educational contexts. In order to enhance the generalizability of findings to various language learning settings, it is recommended that future research endeavours incorporate a more diverse array of contexts. An additional constraint pertains to the cross-sectional design employed in the study, wherein data was collected at a singular instance. This methodology imposes limitations on the capacity to establish causal relationships or monitor the changing dynamics of the variables across time.

In order to mitigate this constraint, forthcoming research endeavours should employ longitudinal methodologies, thereby facilitating a more exhaustive investigation into the dynamics of these factors as they evolve over the course of language acquisition. Furthermore, the research was dependent on self-report instruments to assess variables such as teacher beliefs, student attitudes, and teacher profiles. Self-report data has the potential to be influenced by biases and inaccuracies, which can have implications for the reliability and validity of the findings. Future research has the potential to improve the quality of data by integrating a blend of self-report measures and observational methods. Finally, it should be noted that although the sample size in this study was considerable, consisting of 13 teachers and 278 students, it is important to acknowledge that it may still have certain limitations in terms of adequately representing the complete range of language learners. In order to enhance statistical power and promote the generalizability of findings, it is recommended to broaden the participant pool in future research endeavours.

This study presents various potential areas for future research. To begin with, conducting comparative studies across diverse languages and cultural contexts may provide insights into potential variations in the influence of phonetics integration, teacher beliefs, and student attitudes on language learning outcomes. Conducting comparative studies would facilitate the identification of context-specific factors that influence the process of language acquisition. The investigation of longitudinal research presents a promising avenue for further scholarly inquiry. An investigation into the progression of these relationships over a prolonged duration may yield valuable insights into the enduring consequences of phonetics integration, as well as the durability of teacher convictions and student dispositions throughout the process of language acquisition. The integration of quantitative and qualitative data collection methods in mixed-methods approaches presents an opportunity to gain more profound insights.

The utilisation of qualitative data facilitates a comprehensive comprehension of the fundamental rationales behind observed associations and reveals supplementary variables that impact the outcomes of language acquisition. Furthermore, future research might explore the effectiveness of teacher training interventions designed to enhance teacher beliefs about pronunciation instruction. This would allow for a direct examination of the impact of such interventions on language learning outcomes. Considering the growing role of technology in language education, investigations into the impact of digital tools and online resources on phonetics instruction, teacher practices, and student attitudes would be pertinent. This research would be particularly relevant in the context of remote and online language learning, which has become increasingly prevalent. Lastly, a comparative analysis of different language curricula, some emphasizing phonetics and others not, could provide practical insights for curriculum designers and educators. Such a study could assess the relative effectiveness of phonetics integration on pronunciation outcomes.

In conclusion, while this research has advanced our understanding of language education, it also points to several avenues for future investigation. Exploring these directions can further enrich our comprehension of language learning processes and inform evidence-based practices for educators and policymakers worldwide.

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