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DEVELOPING AN INSTRUCTIONAL FRAMEWORK FOR ADDRESSING LEARNER PERPLEXITY IN MANDARIN PRONUNCIATION IN MALAYSIAN UNIVERSITY CLASSROOMS

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Abstract:

Mandarin pronunciation can be challenging for Malaysian university learners because its tonal and phonological features differ from those of their first languages. Previous studies have mainly examined pronunciation errors and learning strategies, with less attention given to how learners themselves perceive the difficulties they encounter when learning Mandarin pronunciation. In this study, these perceived difficulties are referred to as learner perplexity. The study examines the factors associated with learner perplexity, identifies the pronunciation learning strategies reported by learners, and uses these findings to propose a pedagogical framework for Mandarin pronunciation instruction. A descriptive survey was conducted with 60 undergraduate students enrolled in Mandarin elective courses at a Malaysian public university. The questionnaire data were analysed using descriptive

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statistics in SPSS version 29. The findings show that differences between Mandarin tones and learners' non-tonal first languages were the most strongly reported factor (M = 4.33, SD = 0.93), with 58.3% of the respondents strongly agreeing that this contributed to their pronunciation difficulties. Learners also reported difficulties with unfamiliar Mandarin sounds and limited opportunities to practise the language. For pronunciation learning strategies, 86.7% of the respondents strongly agreed that they did not mind having their pronunciation corrected by the teacher. Repetition after the teacher (68.3%) and reading aloud during self-study (65.0%) were also strongly endorsed. Based on these findings, the Mandarin Pronunciation Support Framework (MPSF) is proposed with three stages: input enhancement, guided practice, and autonomous practice. The framework links learners' reported pronunciation difficulties with the learning strategies identified in the study and provides a practical basis for supporting Mandarin pronunciation instruction in Malaysian university classrooms.

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Keyword:

Language Pedagogy; Learner Perplexity; Malaysian University Learners; Mandarin Pronunciation; Pronunciation Learning Strategies; Second Language Acquisition

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Introduction

Background of the Study

In recent years, Mandarin has increasingly gained recognition as one of the most important global languages for communication, education, and professional development. In Malaysia, the growth of economic and diplomatic ties with China has contributed to a greater interest in Mandarin language learning. University students, especially those from non-Chinese language background, viewed Mandarin as a valuable asset for future career opportunities (Ting et al., 2024). As a result, Mandarin elective courses are becoming increasingly common in higher education institutions. Nonetheless, Mandarin language continues to be challenging for non-native speakers due to its tonal system and distinct phonological characteristics.

Problem Statement and Research Gap

Mandarin relies heavily on four lexical tones to distinguish meaning. Minor differences in tone can completely change the meaning of a word. These changes then may lead to miscommunication or misunderstandings. Many languages such as Bahasa Melayu, English, Arabic do not have tonal distinctions. Learners who used non-tonal language as their first language considered Mandarin tones as the most challenging elements (Hao, 2012). This has been reported in several studies (Yang, 2024; Ting & Ye, 2023; Ah Kow & Ying, 2014) that

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mentioned negative transfers from non-native learners' first languages influence their pronunciation. Hao (2012) also noted that learners may have difficulty producing sounds that are unfamiliar to them. These linguistic differences can therefore contribute to the pronunciation difficulties experienced by non-native Mandarin learners.

Since the major challenges in Mandarin pronunciation have been identified, the learning strategies adopted by students should also be examined. Numerous studies have emphasised the role of pronunciation learning strategies in supporting Mandarin pronunciation learning. Ting and Ooi (2023), for example, found that guided repetition, teacher corrective feedback, imitation, and reading aloud were frequently used by learners. Ting et al. (2024) further noted the importance of context-sensitive pronunciation instruction in multilingual learning environments such as Malaysia.

However, much of the existing research has examined pronunciation difficulties in terms of specific phonological problems, pronunciation errors, or learning strategies. Less attention has been given to how learners themselves perceive and experience these difficulties and the conditions that contribute to them. In this study, learner perplexity refers to the confusion, uncertainty, and perceived difficulty experienced by learners when learning Mandarin pronunciation. It is used to describe how learners perceive and make sense of the pronunciation challenges they encounter, rather than their actual pronunciation performance. Learner perplexity is also distinguished from language anxiety, which generally concerns feelings of nervousness or apprehension during language learning or communication. In the present study, perplexity is examined through learners' reported experiences of linguistic difficulties, learning conditions, and opportunities for practice and interaction.

By examining learner perplexity alongside learners' reported pronunciation learning strategies, the study seeks to provide a clearer basis for identifying the types of pedagogical support that may be useful in Malaysian university Mandarin classrooms.

Research Objectives

This study aims:

1. To examine the factors contributing to learner perplexity in Mandarin pronunciation among Malaysian university learners.
2. To investigate the pronunciation learning strategies reported by Malaysian university learners.
3. To propose a pedagogical framework for supporting Mandarin pronunciation learning in Malaysian university classrooms.

Research Questions

This study addresses the following research questions:

1. What factors contribute to learner perplexity in Mandarin pronunciation among Malaysian university learners?
2. What pronunciation learning strategies are reported by Malaysian university learners?
3. How can the findings on learner perplexity and pronunciation learning strategies inform the development of a pedagogical framework for Mandarin pronunciation instruction?

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Significance Of Study

This study offers a learner-centred view of Mandarin pronunciation learning by examining the difficulties reported by learners themselves. Instead of looking only at pronunciation errors or specific phonological features, it considers how learners perceive the linguistic and learning conditions that make pronunciation difficult. The study also examines the strategies learners report using when dealing with these difficulties. Looking at both aspects together may help Mandarin instructors identify areas where learners need more support and select forms of practice that are relevant to their needs. The proposed MPSF brings these findings together through input enhancement, guided practice, and autonomous practice. As a proposed framework, it can be further examined and refined through future classroom-based research.

Literature Review

Learner Perplexity in Mandarin Pronunciation

Second language pronunciation learning can be challenging as learners need to familiarise themselves with a new sound system. In this study, learner perplexity refers to learners' perceived confusion, uncertainty, and difficulty when learning Mandarin pronunciation. These experiences may become particularly noticeable when learners encounter Mandarin tones and phonological features that differ from those in their first languages.

Learner perplexity is used in this study to focus on how learners perceive and experience pronunciation difficulties rather than solely on whether particular pronunciation features are produced accurately or inaccurately. It may arise from linguistic challenges, such as unfamiliar tones or sounds, but may also be influenced by instructional conditions, opportunities for practice, and the learning environment. Therefore, the concept provides a broader learner-centred perspective for examining the conditions that learners themselves perceive as contributing to difficulties in Mandarin pronunciation learning.

Previous studies on Mandarin pronunciation have largely examined pronunciation errors, phonological interference, and learning strategies (Hao, 2012; Ting & Ooi, 2023). Although these studies provide important insights into the linguistic and pedagogical challenges of Mandarin pronunciation, less attention has been given to how learners themselves perceive and experience these difficulties during the learning process. Examining learner perplexity may therefore complement existing pronunciation research by drawing attention to learners' perceptions of the conditions surrounding their pronunciation learning.

Within the Malaysian university context, this perspective is particularly relevant because Mandarin is often learned as an elective language with limited exposure outside formal instruction. Understanding what learners perceive as confusing or difficult may help instructors identify where additional pronunciation support is needed. Different sources of perplexity may also require different forms of pedagogical support.

Mandarin Pronunciation Learning Strategies

Mandarin learners employ various strategies to manage pronunciation difficulties, including repetition, corrective feedback, reading aloud, imitation, and interaction with others. These

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strategies provide opportunities for learners to receive pronunciation input, practise oral production, and monitor their own pronunciation.

Guided repetition and teacher corrective feedback are among the strategies reported in Mandarin pronunciation learning. Repeated practice gives learners more opportunities to familiarize themselves with unfamiliar sounds and tones, while corrective feedback can draw their attention to pronunciation problems (Saito & Lyster, 2012). In situations involving unfamiliar sounds or tonal distinctions, Malaysian learners frequently rely on repetition strategies when learning Mandarin pronunciation (Ting & Ooi, 2023). Next, teacher feedback may also play an important role in helping students identify pronunciation errors that they may not notice on their own and help students to make immediate corrections. According to Yang (2014), teacher feedback contributes positively to pronunciation improvement by helping learners become more aware of their errors and helping them to gradually develop more accurate pronunciation patterns. Likewise, Zhou and Yang (2019) highlighted that explicit and timely corrective feedback plays a significant role in improving second language pronunciation, particularly when accompanied by opportunities for repeated practice.

Pronunciation practice does not need to take place only with a teacher. Learners may also practise pronunciation independently through reading aloud, imitating pronunciation models, and repeating Mandarin sounds or words. Such practice gives them additional opportunities to produce the target sounds outside formal classroom activities. Structured practice, particularly when combined with instructional guidance, may support pronunciation development (Lee et al., 2014). Besides, Interaction with teachers, peers, or other Mandarin speakers provides another setting in which learners can practise pronunciation and receive responses to their spoken production.

The learning context is also important when considering pronunciation strategies. Ting et al. (2024) emphasised the need to consider learners' linguistic backgrounds, classroom environments, and exposure to Mandarin when supporting pronunciation learning in Malaysia. However, previous studies have mainly focused on identifying the pronunciation strategies used by learners. Examining this relationship may provide a clearer basis to design pronunciation support that responds to learners' actual needs.

Theoretical Foundation of Mandarin Pronunciation Learning

Mandarin pronunciation learning involves more than exposure to tones and unfamiliar sounds. Learners also need opportunities to notice pronunciation gaps, produce spoken language, receive feedback, and gradually develop greater control over their own practice. Accordingly, this study draws on Long's Interaction Hypothesis, Swain's Output Hypothesis, and Vygotsky's Sociocultural Theory to explain different aspects of this learning process. These theories also provide the theoretical basis for the proposed Mandarin Pronunciation Support Framework (MPSF).

Long's Interaction Hypothesis

Long's (1996) Interaction Hypothesis places interaction at the centre of second language learning. Through interaction, learners can receive feedback, seek clarification, and notice differences between what they intend to say and what they are able to produce (Long, 1996; Mackey & Gass, 2021). This perspective is relevant to the present study because some learners

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reported limited opportunities to use Mandarin outside the classroom. For these learners, classroom interaction provides an additional opportunity to practise pronunciation with teachers and peers. It also allows pronunciation problems to be noticed and addressed during spoken practice. In a context where exposure to Mandarin outside formal instruction may be limited, such classroom opportunities become particularly relevant.

Swain's Output Hypothesis

Swain's (1985) Output Hypothesis emphasises the role of language production in helping learners recognise gaps in their language use. Listening to Mandarin tones and sounds is not the same as producing them. In Mandarin pronunciation learning, producing spoken language requires learners to move beyond recognising tones and sounds to producing them during communication. Spoken production may make learners more aware of aspects of pronunciation that remain difficult. Activities such as guided repetition, imitation, and reading aloud provide opportunities for learners to practise oral production and notice difficulties in their pronunciation (Swain, 1985; Sato & McDonough, 2019). This perspective serves as the foundation for the guided-practice stage of the MPSF, where learners are given opportunities to produce Mandarin pronunciation with instructional support.

Vygotsky's Sociocultural Theory

Vygotsky's Sociocultural Theory adds another important dimension by highlighting the role of scaffolding and teacher support. From this perspective, learners may be able to perform a task with appropriate support such as modelling, correction, explanation and guided practice before they are able to perform it independently (Vygotsky, 1978; Lantolf et al., 2015). This is particularly consistent with the Malaysian university context, where learners often depend on teachers as their main source of pronunciation input and support. The relevance of such support is also reflected in the present findings, particularly learners' receptiveness to teacher correction and their reported use of repetition after the teacher. Within the MPSF, this support is gradually reduced as learners move towards greater self-monitoring and independent pronunciation practice.

Taken together, these three perspectives help explain different parts of the proposed framework. Interaction creates opportunities for practice and feedback, output requires learners to produce the target sounds, and scaffolding explains how support can be provided before learners practise more independently. These ideas inform the progression from input enhancement to guided practice and autonomous practice in the MPSF.

Methodology

Research Design

This study is quantitative research that utilises a descriptive survey design. The questionnaire was selected because the study focused on learners' reported experiences of Mandarin pronunciation, particularly the difficulties they encountered and the strategies they used when learning pronunciation. The survey also allowed responses to be collected from learners at three Mandarin course levels. Descriptive statistics were then used to identify patterns in the responses and to compare the relative prominence of the factors and strategies examined in the questionnaire (Creswell & Creswell, 2018).

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Participants and Sampling

The study involved 60 undergraduate students taking Mandarin elective courses at a Malaysian public university. Stratified random sampling was used to include learners from all three Mandarin course levels. Of the 60 participants, 36 (60%) were enrolled in Mandarin I, while Mandarin II and Mandarin III each contributed 12 participants (20%). Participants came from different classes taught by different instructors, providing representation across the three course levels rather than from a single class.

Table 1: Distribution of Participants by Mandarin Course Level

Course Level	Number of Students	Percentage (%)
Mandarin I	36	60
Mandarin II	12	20
Mandarin III	12	20
Total	**60**	**100**

Instrumentation

A questionnaire was employed as the primary instrument for data collection. The questionnaire comprised 23 items organised into three parts: three items on learners' views of Mandarin learning, nine items examining factors contributing to difficulties in Mandarin pronunciation, and eleven items examining pronunciation learning strategies. The items were rated on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

To establish content validity, the questionnaire items were reviewed by three experts in Mandarin language teaching. Two of the experts were Mandarin teachers from Universiti Utara Malaysia, while the third was from Kongzi Institute, Universiti Malaya. The review was conducted to ensure that the questionnaire items were relevant to the study objectives and appropriate for the research context.

Internal consistency was assessed using Cronbach's alpha in SPSS version 29. The nine items measuring factors contributing to Mandarin pronunciation difficulties recorded a Cronbach's alpha coefficient of .712, while the eleven items measuring pronunciation learning strategies recorded a coefficient of .749.

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Table 2: Reliability of the Instrument

	Number of items	Cronbach's alpha
Section B	9	0.712
Section C	11	0.749

Data Collection Procedure

Before completing the questionnaire, participants were informed about the purpose of the study and the voluntary nature of their participation. They were assured that their responses would remain confidential and would be used only for academic purposes. Participants were also informed that they could withdraw from the study at any time.

The questionnaire was prepared using Google Forms, and the survey link was shared with selected undergraduate students through WhatsApp. The participants were enrolled in Mandarin I, Mandarin II, or Mandarin III and came from different Mandarin classes. Instructions for completing the questionnaire were provided together with the survey. As the questionnaire focused on learners' experiences and perceptions of Mandarin pronunciation learning, participants were informed that there were no right or wrong answers.

Data Analysis

Questionnaire responses were analysed in SPSS version 29. Frequencies and percentages were calculated to show how participants responded to individual items. Means and standard deviations were also calculated for the nine items related to learner perplexity and the eleven items on pronunciation learning strategies. These statistics were used to identify which factors and strategies received stronger or weaker levels of agreement among the participants. The results are presented in tables according to the two main areas examined in the study.

Findings and Discussion

Factors Contributing to Learner Perplexity in Mandarin Pronunciation

The first research question examined the factors contributing to learner perplexity in Mandarin pronunciation. Descriptive statistics were used to summarise participants' responses to the nine questionnaire items. Table 3 presents the mean and standard deviation for each item, with higher mean scores indicating stronger agreement that the factor contributed to difficulties in learning Mandarin pronunciation.

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Table 3: **Factors Contributing to Learner Perplexity in Mandarin Pronunciation**

Factor	M	SD
Mandarin is tonal whereas learners' first language is non-tonal	4.33	0.93
Some Mandarin vowels and consonants are unavailable in English or Malay	3.83	0.96
Lack of a conducive environment for Mandarin practice	3.52	1.11
Insufficient time allocated for learning Mandarin	3.43	1.03
Difficulty pronouncing aspirated consonants	3.38	1.12
Confusion in pronouncing certain vowels and consonants	3.28	1.03
Lack of Chinese friends with whom to practise Mandarin	3.22	1.49
Hardly paying attention in Mandarin class	2.38	1.33
Lack of enthusiasm for learning Mandarin	2.35	1.09

As shown in Table 3, the highest mean score was recorded for the difference between Mandarin as a tonal language and learners' non-tonal first languages (M = 4.33, SD = 0.93). This finding indicates that tonal differences were the most strongly perceived source of pronunciation difficulty among the participants. In addition, 58.3% of the participants strongly agreed with this statement.

The second highest mean was recorded for Mandarin vowels and consonants that are unavailable in English or Malay (M = 3.83, SD = 0.96). Other factors receiving relatively higher levels of agreement included the lack of a conducive environment for Mandarin practice (M = 3.52, SD = 1.11), insufficient learning time (M = 3.43, SD = 1.03), and difficulty pronouncing aspirated consonants (M = 3.38, SD = 1.12).

In contrast, hardly paying attention in Mandarin class (M = 2.38, SD = 1.33) and lack of enthusiasm for learning Mandarin (M = 2.35, SD = 1.09) recorded the lowest mean scores. These findings suggest that participants generally perceived their pronunciation difficulties as being more closely related to linguistic features and learning conditions than to a lack of attention or enthusiasm.

The findings indicate that learner perplexity in Mandarin pronunciation was most strongly associated with linguistic differences, particularly the tonal nature of Mandarin. The highest mean score was recorded for the difference between Mandarin as a tonal language and learners' non-tonal first languages (M = 4.33, SD = 0.93). This finding is consistent with previous research showing that tones present considerable challenges for learners whose first languages do not use lexical tones (Hao, 2012). For learners who are more familiar with non-tonal languages such as Malay and English, the need to distinguish meaning through pitch variation may create additional difficulty when perceiving and producing Mandarin syllables.

Difficulties involving unfamiliar Mandarin vowels and consonants also received relatively high agreement (M = 3.83, SD = 0.96). This supports previous observations that differences between the sound systems of learners' first language and the target language may contribute to pronunciation difficulties (Zhang & Yin, 2009). The findings therefore suggest that learner

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perplexity is not limited to tones but also involves unfamiliar segmental features that learners need to perceive and produce during pronunciation learning.

Beyond linguistic factors, participants also reported difficulties related to their learning conditions. The lack of a conducive environment for practising Mandarin (M = 3.52, SD = 1.11) and insufficient learning time (M = 3.43, SD = 1.03) received moderate levels of agreement. Similarly, the lack of Chinese friends with whom to practise Mandarin showed considerable variation among participants (M = 3.22, SD = 1.49). These findings suggest that opportunities for pronunciation practice may differ considerably across learners. In a context where Mandarin is learned mainly through formal university courses, opportunities to hear and use the language outside the classroom may therefore be limited for some students.

In contrast, lack of attention and lack of enthusiasm recorded the lowest mean scores. This suggests that the participants did not generally attribute their pronunciation difficulties to disengagement from Mandarin learning. Taken together, the findings portray learner perplexity as a multidimensional experience involving linguistic challenges as well as environmental, instructional, and social conditions. From a pedagogical perspective, these different sources of difficulty suggest that pronunciation support should extend beyond explaining individual sounds and tones to providing learners with structured opportunities for guided and independent practice.

Pronunciation Learning Strategies Employed by Learners

The second research question examined the pronunciation learning strategies reported by the participants. Table 4 presents the mean and standard deviation for the eleven strategy items. Higher mean scores indicate stronger agreement with using the respective strategies.

Table 4: Descriptive Statistics for Pronunciation Learning Strategies

Strategy	M	SD
Being receptive to teacher correction of pronunciation	4.78	0.69
Repeating after the teacher	4.57	0.79
Reading Mandarin words aloud during self-study	4.53	0.77
Paying attention to the position of the lips and tongue	4.17	0.98
Visualising the tone before saying it aloud	4.05	1.06
Watching Chinese movies and dramas	4.00	0.90
Using smartphone applications for pronunciation practice	3.97	1.16
Asking a native Chinese speaker to demonstrate pronunciation	3.92	1.06
Singing and listening to Chinese music	3.67	1.13
Subscribing to Mandarin channels on YouTube	2.98	1.23
Regularly practising Mandarin with Chinese friends	2.88	1.40

As shown in Table 4, the highest mean score was recorded for participants' receptiveness to teacher correction of their pronunciation (M = 4.78, SD = 0.69). A total of 86.7% of the participants strongly agreed that they did not mind having their pronunciation corrected by their teacher. Repeating after the teacher (M = 4.57, SD = 0.79) and reading Mandarin words

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aloud during self-study (M = 4.53, SD = 0.77) were also among the most strongly endorsed strategies, with 68.3% and 65.0% of participants respectively selecting Strongly Agree.

Other highly endorsed strategies included paying attention to the position of the lips and tongue (M = 4.17, SD = 0.98), visualising tones before producing them aloud (M = 4.05, SD = 1.06), watching Chinese movies and dramas (M = 4.00, SD = 0.90), and using smartphone applications for pronunciation practice (M = 3.97, SD = 1.16). In comparison, subscribing to Mandarin channels on YouTube (M = 2.98, SD = 1.23) and regularly practising Mandarin with Chinese friends (M = 2.88, SD = 1.40) recorded the lowest mean scores.

The findings show that participants reported strong engagement with strategies involving teacher guidance and active pronunciation practice. Receptiveness to teacher correction recorded the highest mean score (M = 4.78, SD = 0.69), followed by repeating after the teacher (M = 4.57, SD = 0.79) and reading Mandarin words aloud during self-study (M = 4.53, SD = 0.77). These findings indicate that teacher support remains important in pronunciation learning, while learners also engage in independent practice beyond direct classroom instruction.

The strong response to teacher correction highlights the role of instructional guidance in helping learners recognise and address pronunciation problems. Similarly, repetition after the teacher provides learners with a pronunciation model that they can imitate and practise. These findings are consistent with Ting and Ooi (2023), who reported the use of guided repetition and corrective feedback among learners of Mandarin pronunciation. From the perspective of the Interaction Hypothesis (Long, 1996), corrective feedback may draw learners' attention to differences between their own production and the target form during interaction.

The findings also show that learners reported strategies requiring active production. Reading aloud during self-study was among the most highly endorsed strategies, while paying attention to the position of the lips and tongue and visualising tones before speaking also recorded relatively high mean scores. These strategies require learners to actively attend to and produce Mandarin pronunciation rather than relying solely on passive exposure. This can be interpreted in relation to Swain's (1985, 1995) Output Hypothesis, which emphasises the role of language production in encouraging learners to notice gaps in their linguistic knowledge and test their developing understanding of the target language.

The findings also show that learners reported using strategies that can be practised independently. Reading aloud during self-study was among the more strongly endorsed strategies, while learners also reported watching Chinese movies and dramas and using smartphone applications. These responses suggest that pronunciation practice can continue beyond teacher-led classroom activities. This is relevant to the difficulties reported in RQ1, particularly the limited opportunities to practise Mandarin. When interaction with Mandarin speakers is limited, independent practice may provide learners with additional opportunities to hear and produce Mandarin.

When the findings from both research questions are considered together, three areas of pronunciation support can be identified. First, the difficulties associated with Mandarin tones and unfamiliar sounds point to a need for clearer and more focused pronunciation input. Second, learners' strong receptiveness to teacher correction and their reported use of repetition support the inclusion of teacher-guided pronunciation practice. Third, strategies such as reading aloud and the use of digital resources show that learners also engage in pronunciation practice

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independently. These three areas form the basis of the proposed MPSF: input enhancement, guided practice, and autonomous practice.

Development of the Mandarin Pronunciation Support Framework (MPSF)

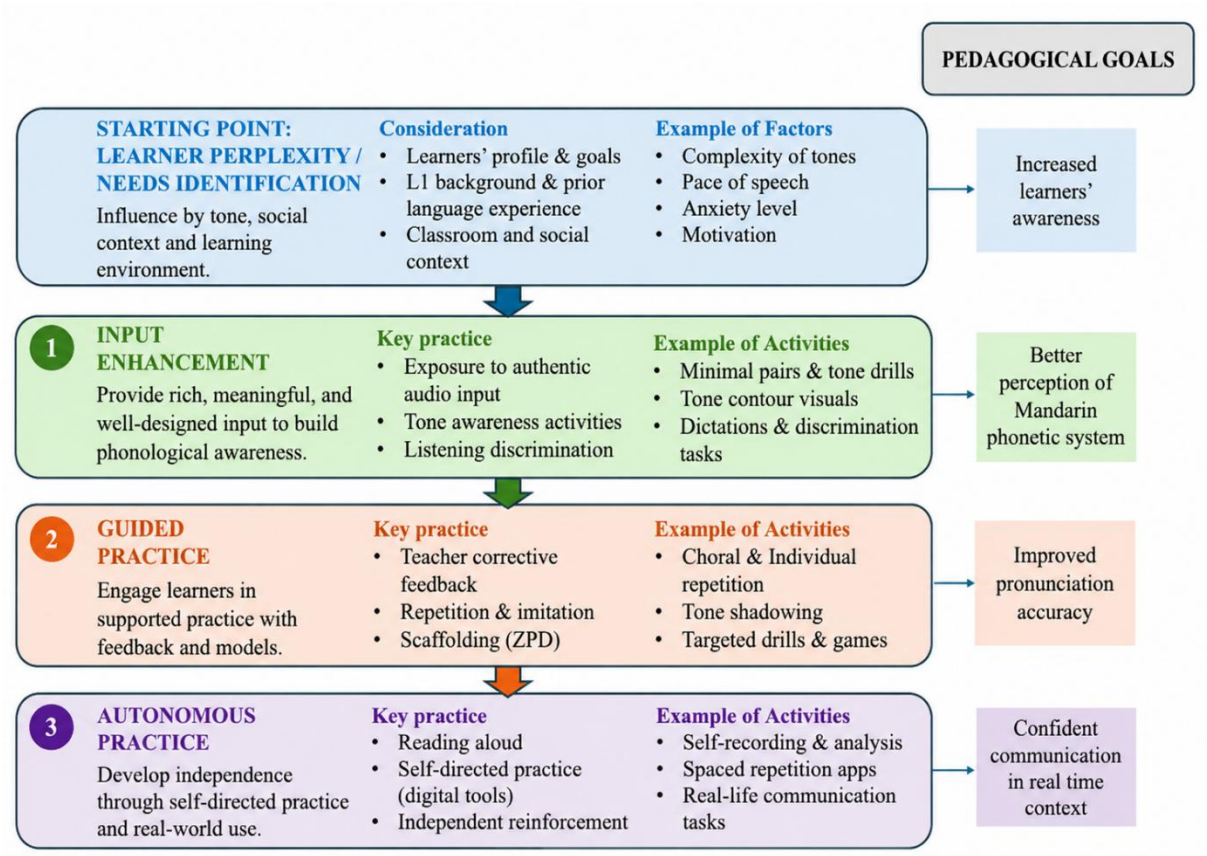


Figure 1: Proposed Mandarin Pronunciation Support Framework (MPSF)

The MPSF was developed by bringing together the main difficulties and learning strategies identified in this study. It begins with learner needs because the findings show that pronunciation difficulties do not arise from a single source. Learners reported difficulties related to Mandarin tones and unfamiliar sounds as well as limited opportunities for practice. The framework therefore starts by considering the pronunciation areas that learners find difficult and the learning conditions in which these difficulties occur.

The first stage, input enhancement, focuses on helping learners notice and become familiar with Mandarin pronunciation features. This stage responds particularly to the difficulties reported with tones and unfamiliar phonological features. Teachers may provide clearer models, draw attention to tonal contrasts, and use listening or discrimination activities before asking learners to produce the target sounds.

The second stage, guided practice, reflects the strong role of teacher-supported strategies in the findings. Participants reported high receptiveness to teacher correction, and repetition after the teacher was also among the more strongly endorsed strategies. At this stage, learners practise pronunciation with modelling, repetition, feedback, and other forms of instructional support.

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The third stage, autonomous practice, extends pronunciation work beyond teacher-guided activities. Reading aloud during self-study was strongly endorsed, while learners also reported using resources such as Chinese movies, dramas, and smartphone applications. These strategies can provide additional opportunities for pronunciation practice when learners have limited access to Mandarin interaction outside the classroom.

The three stages are connected, but they are not intended to represent a fixed sequence that every learner must follow in the same way. Teachers may move between the stages according to learners' needs, course level, and classroom conditions. The MPSF should therefore be understood as a proposed pedagogical guide derived from the present findings rather than as an empirically validated intervention.

Input Enhancement

The first stage focuses on helping learners notice and distinguish unfamiliar Mandarin pronunciation features before expecting accurate production. This stage is informed by the finding that the tonal nature of Mandarin was the most strongly perceived pronunciation difficulty, followed by unfamiliar vowels and consonants. Teachers may therefore provide clear pronunciation models, focused listening activities, visual representations of tones, and explicit demonstrations of articulatory features. The purpose of this stage is to make difficult pronunciation features more perceptually salient and accessible to learners.

Guided Practice

The second stage provides opportunities for learners to practise pronunciation with teacher support. This stage is directly informed by the high levels of agreement with teacher correction and repetition after the teacher. Activities may include teacher modelling, controlled repetition, guided reading aloud, focused pronunciation practice, and corrective feedback. From a sociocultural perspective, such support can function as scaffolding that assists learners while they are developing greater control over unfamiliar pronunciation features.

Autonomous Practice

The third stage encourages learners to extend pronunciation practice beyond direct teacher guidance. This stage draws particularly on the strong endorsement of reading aloud during self-study, together with the reported use of movies, dramas, smartphone applications, and other forms of independent practice. These activities may be especially useful where opportunities to use Mandarin outside the classroom are limited. The aim is not to remove teacher support completely but to gradually provide learners with strategies that allow them to continue practising pronunciation more independently.

The MPSF therefore connects the difficulties reported by learners with forms of pedagogical support that reflect their reported learning strategies. Rather than treating learner perplexity as a single pronunciation problem, the framework recognises that learners may require different forms of support at different points in the learning process. The framework is theoretically informed by perspectives on input, interaction, output, and scaffolding, while its pedagogical components are grounded in the patterns identified in the present study.

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The MPSF should be regarded as a proposed pedagogical framework rather than an empirically validated intervention. Although its components are informed by the present findings and relevant second language acquisition perspectives, the framework was not implemented or evaluated as part of this study. Future research should therefore examine its implementation in authentic Mandarin classrooms and investigate how the framework may be refined across different learner groups and instructional contexts.

Implications for Mandarin Pronunciation Instruction

The findings have several implications for Mandarin pronunciation instruction in Malaysian university classrooms. First, the prominence of tones and unfamiliar sounds in learners' responses suggests that these areas may require more explicit attention during instruction. Providing pronunciation models alone may not be sufficient for learners who have difficulty distinguishing or producing unfamiliar features. Teachers can include opportunities for learners to listen, compare, repeat, and receive feedback on these features.

Second, the strategy findings show that teacher support remains relevant to these learners. Their receptiveness to correction and reported use of repetition suggest that feedback and guided practice can be incorporated into pronunciation activities. At the same time, learners also reported strategies that can be used independently. Pronunciation instruction can therefore include both teacher-supported practice and activities that learners can continue outside class. For Mandarin instructors in Malaysian universities, the findings also highlight the importance of considering the learning environment. Some learners may have few opportunities to use Mandarin outside formal lessons. Classroom pronunciation activities and accessible self-practice resources may therefore provide additional opportunities for them to hear and produce Mandarin.

Limitations

Several limitations should be considered when interpreting the findings. First, the study involved 60 learners from one Malaysian public university. The findings therefore describe this particular group and should not be generalised to all learners of Mandarin in Malaysian higher education. Second, the study relied on self-reported questionnaire responses. The results represent learners' perceptions and reported strategies rather than direct measures of their pronunciation performance. Future studies could combine questionnaire data with pronunciation assessments, interviews, or classroom observations.

The MPSF is another limitation of the present study. Although it was developed from the study findings and relevant theoretical perspectives, it was not implemented or evaluated in the classroom. Its practicality and educational value therefore remain to be examined. Future research could implement the framework in Mandarin classes and investigate how it functions across different learner groups and instructional settings.

Conclusion

This study examined the factors contributing to learner perplexity in Mandarin pronunciation and the pronunciation learning strategies reported by 60 university learners in Malaysia. The findings showed that linguistic differences, particularly the tonal nature of Mandarin and unfamiliar phonological features, were among the most strongly perceived sources of

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pronunciation difficulty. Environmental and instructional conditions, including limited opportunities for practice, were also reported as contributing factors.

In relation to pronunciation learning strategies, participants showed particularly strong receptiveness to teacher correction, repetition after the teacher, and reading aloud during self-study. Taken together, these findings suggest that Mandarin pronunciation instruction may benefit from combining explicit pronunciation input and teacher-guided practice with opportunities for learners to develop more independent forms of pronunciation practice.

Based on these findings, the study proposes the Mandarin Pronunciation Support Framework (MPSF), comprising input enhancement, guided practice, and autonomous practice. The contribution of the framework lies in translating learners' reported pronunciation difficulties and learning strategies into a structured progression of pedagogical support. The framework therefore offers one way of connecting the pronunciation difficulties reported by learners with the forms of support and practice identified in the study. It is intended as a context-sensitive pedagogical guide for Mandarin pronunciation teaching rather than a tested model of instructional effectiveness.

Further research is needed to examine the MPSF in actual Mandarin classrooms. Classroom-based studies could explore how teachers and learners use the three stages, whether modifications are needed during implementation, and how the framework works with learners from different linguistic backgrounds and proficiency levels.

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