

# Challenges and Strategies in Teaching Mandarin Chinese Tones: A Study on Teachers of Chinese as an Additional Language (CAL) in Macau

Zhai Siyu, Gong Yang Frank, and Zhang Luyao

## Abstract

*Tone instruction is an integral component of Chinese as an additional language (CAL) education. The present study aimed to explore the challenges and strategies of teaching of Mandarin Chinese tones in the multilingual and multicultural context of Macau SAR, China. Employing a qualitative methodology, this study drew on multiple data sources (e.g. classroom observations and interviews) of five participants. It revealed various challenges in teaching Mandarin Chinese tones, such as the backgrounds of CAL learners, the teaching context, and the sociocultural environment. At the same time, the teacher participants employed a range of strategies that included cognitive, emotional, and behavioural aspects to address these challenges. This study not only enriches our understanding of the complexities of Mandarin Chinese tones teaching but also provides practical implications for CAL teachers in teaching Mandarin Chinese tones within complex teaching contexts.*

KEYWORDS: TEACHING CHINESE AS AN ADDITIONAL LANGUAGE (CAL); MANDARIN CHINESE TONES; CHALLENGES; STRATEGIES

---

## Affiliations

Zhai Siyu: University of Macau, China

email: [siyuzhai@outlook.com](mailto:siyuzhai@outlook.com)

Gong Yang Frank: University of Macau, China

email: [frankgong@um.edu.mo](mailto:frankgong@um.edu.mo)

Zhang Luyao: University of Macau, China

email: [luyao.zhang@connect.um.edu.mo](mailto:luyao.zhang@connect.um.edu.mo)

Received: 22 March 2024

Accepted after revision: 8 April 2024

## 1. Introduction

Teaching Chinese as an additional language (CAL) across the world represents a significant cultural and linguistic endeavour. The significance of this endeavour is underscored by the fact that, in 2021, more than 25 million people worldwide were engaged in learning Mandarin Chinese, and the cumulative number of learners and users was approaching 200 million (Ministry of Education of PRC 2021). In the present study, Chinese refers to Mandarin Chinese or Putonghua, a typical tonal language that assigns a specific tone to each syllable. This feature poses a significant challenge to CAL learners (Nel and Soezin 2021). In the initial stage of Putonghua learning, tone learning is an integral component for developing Mandarin Chinese proficiency (Gong and Zhang 2023; Wang *et al.*, 2003). Despite its pivotal role, pronunciation has received limited attention compared to other Mandarin Chinese language skills (Jiang and Cohen 2012).

There are four basic tones in Putonghua: high flat (Tone 1, 一声), rising (Tone 2, 二声), low dipping/falling rising (Tone 3, 三声), and falling (Tone 4, 四声). In addition to the four basic tones, Putonghua also has a 'neutral tone (轻声); whose pitch height and shape is largely determined by the tone of the preceding syllable (Lee and Zee 2014). For CAL teachers, it is imperative to facilitate learners to acquire correct tonal pronunciation and further improve their Mandarin Chinese learning outcome (Li *et al.* 2021).

Previous research has offered valuable insights into how CAL learners' mother tongue, learning strategies, and motivation to learn Putonghua might influence their tone acquisition (Gong *et al.* 2018; Ma *et al.* 2017; Li *et al.* 2021). These studies predominantly adopt a cognitive and learner-centred perspective, shedding light on the individual factors affecting Putonghua tone learning. However, it lacks a comprehensive analysis that integrates multiple perspectives, such as sociocultural perspective (e.g. Liu *et al.* 2011; Sung and Tsai 2014; Ao 2021). It is essential to recognize that language acquisition represents a multi-faceted process that extends beyond cognitive aspects and is deeply intertwined with sociocultural contexts (Gong *et al.* 2021). In addition, it encompasses emotional dimensions that can significantly impact the learning experience (Gong *et al.* 2020). In these circumstances, this research aims to explore challenges and strategies regarding Mandarin Chinese tone teaching from various perspectives. This study was conducted in Macau SAR, China, which is characterized by its rich and diverse linguistic landscape where Chinese, English, and Portuguese are widely spoken (Moody 2019; Gong *et al.* 2023). The chosen participants work in a context where they instruct CAL learners with various ages, professions, motivation, and cultural backgrounds. This regional specificity provides rich data for researchers to delve into the complexity of challenges and strategies of Mandarin Chinese tone teaching.

## 2. Literature Review

### 2.1 Challenges of Teaching Mandarin Chinese Tones

Teachers may encounter challenges in dealing with students' diverse language backgrounds and ages. Previous studies have shown that the ability of CAL learners to distinguish Mandarin Chinese tones was closely related to their native language. For instance, Li (2016) found that native Thai speakers exhibited a higher aptitude for recognizing Mandarin Chinese tones compared to native British English speakers, although neither of the two groups had prior exposure to Chinese. It was also showed that age affected Mandarin Chinese tone identification and perception negatively (Yang *et al.* 2015). For CAL students, especially beginners, errors in tone differentiation were almost unavoidable during the learning process, posing a notable challenge for teachers during instructional teaching process.

CAL teachers may also confront challenges, related to their professional knowledge and beliefs in teaching Mandarin Chinese tones. Nel and Soezin (2021) emphasized that the teacher's language proficiency, teaching philosophy, and classroom management were all issues needing consideration in language teaching. The different beliefs held by CAL teachers, e.g. what aspects to prioritize for tone error correction, and which strategies to employ, had a profound impact on Mandarin Chinese tone teaching effectiveness (Bao 2019). For example, in response to the students' tonal errors, teachers usually guided students to memorize the correct tones. However, the cultivation and improvement of students' tonal awareness were more important than memorization (Rubin 1994). The teacher's teaching philosophy served as a guiding framework that reflected their growth and aspirations in pursuit of educational objectives and values (Sumardani and Dujali 2021). It not only rationalized their actions in the classroom but also provided a platform for self-reflection (Beatty *et al.* 2009). Teachers, guided by their unique teaching philosophies, employed various teaching methods while continuously assessing students' responsiveness to each specific strategy (Godfroid *et al.* 2017). However, facing the complexities and dynamics of the tone teaching context, the challenges lie in how CAL teachers adapt and refine their tone teaching methods to suit the specific context while reconciling them with their teaching philosophy (Smith 2009). Therefore, conducting research within Macau, a multicultural and multilingual context, not only presents an opportunity to delve into the intricacies of Mandarin Chinese tone teaching but also offers a rich and multi-dimensional dataset for in-depth analysis. It allows for a thorough examination of the challenges faced by CAL teachers' tone teaching, stemming from the diverse and dynamic social context in which they operate.

## 2.2 Strategies in Teaching Mandarin Chinese Tones

Recent studies on strategies in Mandarin Chinese tone teaching indicate that multimodal pedagogy has become a prominent concept in language education research (Peng 2019). Studies have shown that musical melody shapes the encoding of the pitch in the human brain (Wong *et al.* 2007). For instance, Wu *et al.* (2015) found that music training could facilitate learners' grasp of the lexical pitch differences by enhancing students' sensitivity to recognize differences between sounds. This suggests that employing music in the classroom can be an effective method for teachers to help students master pitch distinctions. To further enhance their grasp of pitch, learners should focus on further grasping the difference between musical tones and Mandarin Chinese tones (Zhang 2019). In addition, stimulating learners visually can also be an effective approach in tone teaching. Research has shown that meaning-related gestures could enhance the learning of new words. Words with these gestures were learned more effectively than words presented with meaning-related images for CAL students (Tellier 2008). Visible movements of the neck, head, and mouth facilitated students' vocalization of vocabulary tones, which could be effectively utilized after short-term training (Chen and Massaro 2008). At the same time, tonal gestures motivate learners to link the phonology of words to their semantics. Thus, tonal gestures can be used to improve learners' ability to discriminate between the meanings of words with different tones (Morett and Chang 2015).

Currently, the research on teachers' tone teaching strategies is predominantly confined to the cognitive level, with a noticeable absence of comprehensive investigations from various dimensions and angles. In this study, the researchers not only analysed the teaching strategies employed by CAL teachers at the cognitive level but also conducted a comprehensive and integrated examination of teacher strategies, incorporating the affective and behavioural perspectives. This approach offers a more holistic and multifaceted understanding of how CAL teachers employ tone teaching strategies in their educational practices. By delving into these previously underexplored dimensions, the research aims to provide a richer and more comprehensive picture of the subject matter.

## 3. Methodology

This study involves multiple dimensions including teachers' personal experiences, inner thoughts, and reflections. These are complex and diverse, and thus qualitative research is more suitable (Creswell 2014). This study was conducted in Macau SAR, China, with a total of five female CAL teachers, spanning elementary, intermediate, and pre-advanced class levels; to ensure the privacy of the interviewees a numerical and letter-based coding system was employed,

resulting in the five interviewed CAL teachers being identified as A1, B2, B3, C4, and C5. Notably, A1 and C4 have more than five years' teaching experience, and B2, B3, C5 are novice teachers.

Semi-structured interviews were used in this study. Alamri (2019) believed that semi-structured interviews in 'face-to-face' communication allowed interviewers to maximize the information obtained particularly when dealing with partial or ambiguous responses. It was intended to stimulate the thinking of interviewees, thereby enhancing the effectiveness of the interviews. In addition to interviews, this study also included classroom observations across three different classes. The first author initially intended to conduct classroom observations with five teachers at each of the three grade levels (i.e. elementary, intermediate, and advanced levels) for one month. However, upon discovering that tone instruction more frequently occurred in elementary classrooms, the researcher opted to enhance data comprehensiveness by primarily concentrating on observing elementary teachers throughout the semester, while allocating a single lesson each for observing teachers at intermediate and advanced levels. The study objectives provided the basis for the choice of study design, sample population, sample size, and data analysis techniques (Migiro and Oseko 2010). The data analysed in the study were mainly collected from classroom observations and interviews, and therefore they were mainly in textual form rather than numerical. The findings were generated through conversations from classroom observations and interviews with teachers, which included all conversations and activities that took place in the classroom. By doing so, the researchers hope to understand teachers' deep thinking and strategic views on the teaching and learning of CAL, and to clarify teachers' values and beliefs.

Data collected through classroom observations and interviews with teacher participants were manually coded and analysed thematically. Themes were generalized from the data by analysing the data (Xu and Zammit 2020). To ensure the accuracy of the data and the credibility of the subsequent analysis, class notes and interview transcripts were sent back to the participants to see if they had any information to correct or add (Birt *et al.* 2016). This study generalized the data collected through classroom observations and interviews from cognitive, affective, and behavioural perspectives. Finally, coding was categorized to summarize and answer the research questions. After completing the preliminary research findings, the researchers reported the findings to the teachers who participated in the research, understood the participants' views on the results, and made the member check for the findings. In this process, two participants supplemented the results obtained in this study, and the results were also presented in this study. When reporting the research results, teacher B2 pointed out a significant challenge faced by her at present: how to choose the most effective teaching method in the shortest time. This is an important

supplement to the findings of this study. The ethics of voluntary participation in research and the protection of privacy were overarching issues throughout the study.

## 4. Findings

### 4.1 Challenges Faced by CAL Teachers in Teaching Mandarin Chinese tones

Overall, the participants in this study reported three challenges encountered when teaching tones in Macau, which were related to students' backgrounds, teaching context, and the social environment. In the following sections, we will delve into these challenges in detail, drawing upon the participants' responses to provide a comprehensive understanding of each.

#### 4.1.1 *Challenges from CAL Learners' Backgrounds*

CAL learners' backgrounds were the most frequently mentioned challenge by the participants in their interviews. Through data analysis, three kinds of challenges were identified regarding learners' backgrounds: inadequate ability to distinguish tones, low motivation for achieving standard pronunciation, and a deficiency in previous systematic tone learning.

The most frequently mentioned issue highlighted by the participants was the learners' inadequate ability to differentiate tones. In the interviews, all the participants emphasized the teaching challenges posed by students' limited ability to distinguish tones. The capacity to differentiate tones is, to a certain extent, inherent and influenced by innate factors, although it can be enhanced through acquired training (Ericsson 2004). However, this inability presented a significant hurdle in tone teaching because students with poor tone differentiation abilities found it challenging to accurately pronounce tones.

(1)

Many students have difficulties distinguishing the four basic tones, especially Tone 2 and Tone 3. (B3)

This phenomenon was also evident in students' assignments. Some participants reported that many students only wrote the Pinyin (i.e. a system to transcribe Mandarin Chinese sounds into the Latin alphabet) and ignored the tone marks in dictation exercises. This behaviour reflects the students' tendency to disregard the tones, as well as their difficulties in distinguishing the tones.

(2)

Many students can't accurately mark the pitch in dictation. Although they heard what the teacher said, they still cannot accurately mark them. (C5)

Students tried to develop their own learning approaches and habits. For instance, A1 observed that an adult student excelled in tonal learning due to superior pre-learning preparation and post-learning review practices. Conversely, a substantial number of students had yet to establish effective learning habits, resulting in a deficiency in their learning abilities. This deficiency had consequently impeded the overall effectiveness of tone teaching.

The multilingual environment in Macau offers students a broad range of language choices, and as a result, some students had relatively lenient standards for themselves in terms of pronunciation and tones.

(3)

I had a student who is already multilingual, but he didn't take Chinese learning seriously. He thought he didn't need to master it to live his life. (C5)

Students' low motivation was evident through their lack of attention and learning enthusiasm in tones. Learning motivation is one of the most significant factors to influencing students' improvement (Peng and Fu 2021). However, according to the participants' interviews, students usually perceived tones were unnecessary.

(4)

The accuracy of the students' tones may be related to their thoughts. Some students don't pay much attention to the tone. They think it's okay even if my tones are not accurate, so it is a little difficult to teach them. (B3)

For many foreigners, especially those whose native language is a non-tonal language, it is very difficult to develop an awareness of tones and it can only be achieved through systematic learning and teachers' emphasis (Tse and Cheung 2010). Three participants expressed their perspectives on students who lacked a solid grasp of tones, although they had achieved the intermediate or pre-advanced level of Chinese communication. These students had not received systematic Chinese language instruction at school and instead learned Chinese organically in their daily lives. Consequently, they faced frequent difficulties in language production, struggling with tone-related issues. The participants especially highlighted the challenge in the later stages of tone instruction because students did not receive systematic tone training before.

(5)

Many students of this type speak Chinese fluently, but their tonal performance is unsatisfactory. They have hardly established awareness of tones, so they cannot speak them accurately. (C4)

#### 4.1.2 Challenges from the Teaching Context

In the multilingual and multicultural context of Macau, the participants usually needed to contend with diverse learner backgrounds and often address the delicate balance between adopting appropriate teaching methods and remaining faithful to their teaching philosophies. Classroom observations showed that students of all levels had various problems with each tone, and the participating teachers had to use targeted teaching methods. In the interviews, they also mentioned that choosing the most effective method to address students' issues within the limited classroom time posed a significant challenge.

(6)

Each teacher has a set of teaching methods, but we need to find the most effective method to help students overcome difficulties. (A1)

But unexpected incidents often happen in the classroom. When students made new tonal errors, some teachers felt uncertain about the selection of the appropriate tone correction method. Meanwhile, C4 also highlighted the challenges of implementing tone corrections in her pre-advanced classes, expressing, 'I often worry that if I introduce methods my students haven't encountered before, like using singing to identify tones, they might momentarily struggle to accept it.'

(7)

Sometimes it's impossible to immediately understand why the student made a mistake here, so it's hard to pick the best feedback when correcting them. (B3)

The limited class conditions are also a challenge for current tone teaching. Teachers focus on what is the best mode for tonal teaching. Timely feedback can bring more possibilities for the improvement of students' tone levels (Ghafur and Ulfa 2021). But for intermediate and pre-advanced classes, teachers reported that their teaching objective was mainly to improve students' oral communication competence and discourse abilities. It is unreasonable to frequently interrupt students' expressions to correct their tones on the spot. Therefore, under the guidance of such a class model and teaching objectives, how to balance the competing teaching priorities became a problem for teachers.

B2 pointed out that there was no tone test in her classroom, which might affect the effect of tone teaching.

(8)

Class time is limited, and tones aren't the focus of teaching, so we may not be able to correct students' tone errors word by word. (C4)

Some participants reported one of the difficulties they faced was that the limited class duration, making it challenging to provide students with sufficient guidance. The teachers observed in this study had two 90-minute CAL



classes per week. Given this condensed course schedule, delivering timely feedback, whether during class or on recorded assignments, proved to be quite challenging.

#### 4.1.3 Challenges from the social environment

Environmental pressure refers to the influence of the social language environment. Students' cultural adaptation is closely linked to their language learning, their increased cultural knowledge and the development of their communication competence (Gong *et al.* 2021). Macau is a region with diverse languages and cultures.

In such an environment, students were exposed to multiple languages while learning Mandarin Chinese. In addition to their native language, the widespread use of Portuguese and Cantonese also affected their tone learning effectiveness. In the classroom, teachers observed that some students not only asked questions in English, but also substituted Cantonese words when they couldn't express themselves in Mandarin Chinese. This phenomenon mirrored their daily lives where they could use Cantonese instead of Mandarin Chinese to communicate. This practice had consequences on their motivation and accuracy in learning Mandarin Chinese, and the complexity of Cantonese tones also affecting their precise mastery of Mandarin Chinese tones. Therefore, teachers found it challenging maintaining a high standard for students' tone performance in a multilingual environment for teaching tones.

(9)

Sometimes people's Mandarin Chinese production is influenced by Cantonese. Both teachers and students are likely to have a 'Cantonese accent' and teachers need to be aware of this in their teaching over time. (C4)

However, the influence of the language environment on the teaching of tones was seen by some teachers as insignificant. B2 indicated that the impact of the social environment on her teaching was hardly ever noticed or thought about. A1 put most weight on the students themselves, without giving much consideration to the social environment. She believed that students were rarely affected by the environment in which they lived. She reported: 'I use the most suitable teaching method to solve their tone problems according to the characteristics of each student.'

## 4.2 Strategies Adopted by CAL Teachers in Teaching Mandarin Chinese Tones

The researchers found that the participants employed a set of practical approaches to address the existing challenges in teaching Mandarin Chinese tones.

#### *4.2.1 Strategies for Teaching Mandarin Chinese Tones from the Cognitive Perspective*

In this study, it was indicated that the participants used different pedagogical strategies from a cognitive perspective. When teaching a second/foreign language, teachers often use the cognitive principle to guide their teaching to encourage students to use the language without hesitation (Al-Ghazo 2021). The cognitive principle of teaching encourages students to learn the language subconsciously and apply it effectively in different authentic contexts (Brown 2007). Guided by this strategy, the participants developed a range of teaching methods at different learning stages to promote students' accurate mastery of Mandarin Chinese tones.

'Before learning Chinese, many students have not been exposed to tones, so they don't pay much attention to them. In the class, I repeatedly emphasized tones as an important learning objective to students.' A1 pointed out a guiding strategy aimed at reinforcing students' understanding and application of the concept of "tone". In the elementary class, where the basics of the language were established, A1 mentioned that she meticulously scrutinized every tonal mistake and conducted repetitive practice exercises to ensure the accuracy of students' tones. At the same time, the participants teaching intermediate and pre-advanced courses typically corrected tonal errors only when they caused ambiguity. C4 reported that 'in this way, I could save class time, strengthen students' application of Mandarin Chinese, and better accomplish our teaching tasks'.

The participants also presented the teaching concept focusing on enhancing students' awareness of distinguishing different tone. A1 emphasized that 'we need to make sure that the students understand how the correct tone is pronounced, so that they can visualize the difference between their tones and the correct tones.' This pedagogical approach manifested in the classroom by the teacher's consistent correction of students' tonal errors. For the students who struggled to differentiate tones effectively, additional one-to-one instruction was provided after regular class hours. A1 explained that they would offer personalized guidance to students requiring extra assistance with tone pronunciation, both before and after class. This involved deconstructing the pronunciation of words, exclusively focusing on tonal values, and aiding students in identifying tones within their own range. This strategy also allowed students to evaluate their own tone accuracy. Some participants adopted innovative approaches to support students in achieving a more advanced level of proficiency in tones. B3 reported that 'I try the Flipped Class Model with tone teaching, where students could assess each other's tones to improve their tones accuracy.' These various methods collectively contributed to the enhancement of students' memory, comprehension, and effective application of tones.

Language and culture are intertwined, and teaching a language also encompasses teaching the culture of the speakers of that language (Kim 2020). The participants also considered the role of Macau's diverse linguistic environment in their tone teaching. To ensure that students learned tones to a high standard while adapting to this unique environment, teachers made adjustments in two key ways. First, they constantly reinforced students' awareness of tones and required students to practise repetitively. Second, teachers also demonstrated flexibility in adapting evaluation criteria, while ensuring the standardization of students' tones. This flexibility allowed students to adapt effectively to Macau's relatively diverse and inclusive language environment (Lam and Leong 2022; An *et al.* 2024).

#### 4.2.2 Strategies for Teaching Tones from the Emotional Perspective

Tone learning proves to be a challenging task for many CAL students, frequently resulting in negative emotional experiences in their learning (Bao and Du 2015). In this context, it is necessary for teachers to guide students psychologically. Improving students' intrinsic motivation is one of the objectives of teachers' instructional activities. Cherry (2018) defined intrinsic motivation as 'behavior that is driven by internal rewards'. Students with a strong intrinsic motivation are more inclined to actively engage in the classroom environment.

All the participants placed a strong emphasis on the significance of employing a strategy aimed at guiding students to embrace and appreciate Mandarin Chinese tones from an affective perspective. Within their teaching practice, the participants observed that the students' ability to recognize and differentiate tones had a significant impact on their tone learning. However, it's noteworthy that two of the participants explicitly believed that this ability was more closely tied to an individual's physiological predisposition and, to a significant extent, resistant to substantial change through the process of acquisition. This greatly affected the students' grasp of tones and the teacher's long-term negative feedback demotivated students. Therefore, A1 pointed out that when teaching such students, teachers should not simply point out errors. Rather, it is a matter of providing more detailed tone instruction and facilitating their progress through numerous positive feedback. Even though students may not achieve absolute accuracy, it is important to acknowledge their efforts and progress, thereby preventing discouragement.

The flexibility of their assessment criteria was also noted by the participants during the interviews. When assessing students, teachers paid great attention to how to increase students' motivation. They conducted three one-to-one tests in each semester. In the first test, the participating teachers assessed students on relatively strict criteria, guiding students to focus more on their studies in the next stages of learning, leaving them more room for improvement. In the later

tests, students could see gradual improvement in their performance, receiving constant positive feedback and gaining greater motivation.

Moreover, the participating teachers paid close attention to students' learning interests. For instance, B2 and C4 both reported that some students were highly motivated to learn and set up higher standards for themselves. Teachers answered their questions one-to-one according to their needs, and students were further motivated to make new progress in a state where both their internal and external needs were met. This is a strategy to teach tones with the aim of characterization. All these strategies enhance students' interest and enthusiasm in Mandarin Chinese tones at the emotional level.

#### *4.2.3 Strategies for Teaching Tones from the Behaviour Perspective*

Teachers need to constantly imitate, learn, practise, and eventually achieve mastery of the teaching methods and knowledge (Andrews, 2003). Participants reported that their approaches to teaching tones were deeply influenced by experienced elementary class teachers. 'Many of our students have been studying Chinese at our school, and we generally choose methods that are familiar to them when correcting their tone errors so that the students can learn it better.' The participating teachers from all grades also visited the elementary class, to learn the teaching methods and increase their knowledge from experienced teachers.

Several participants also mentioned that they used online resources to constantly upgrade their teaching methods. Teacher C4 said, 'I often study some teaching methods on the internet. When I saw something that fit better with my current teaching, I studied it and tried it out.' At the same time, participants also indicated that they were changing their teaching methods, for example, the adoption of word formation exercises and multimodal teaching methods into the teaching of tones. Teachers can rely on all of these to improve their ability teach tones from the perspective of behaviour.

During their continuous instructional practices, the participating teachers developed systematic and universal approaches to solve students' tone problems. These methods also reflected a behavioural perspective in guiding students to master the Mandarin Chinese tones. This set of strategies mainly consists of the interlanguage correspondence method, the performance method, and the demonstration method, which mainly guides students to imitate, operate, and learn tones from the behavioural level, so as to generate muscle memory of tones and finally master them. Since English is usually used as an interlanguage for CAL in Macau, teachers can teach Mandarin Chinese tones in correspondence with English words at the initial stage, and guide students to establish the concept of tones and imitate the pronunciation of Mandarin Chinese tones. But A1 pointed out that '[The] Interlanguage correspondence method is only used

to help students develop a concept of tone and achieve imitation of tones, but it cannot be used in the long term. This is because no language can be taught and learned by corresponding it to another language.

Through classroom observations and interviews, the researchers found that the teaching method most frequently used in the classroom was the performance method. This is the expression of multimodal pedagogy in the classroom, highlighting the way in which the teaching leads students to produce muscle memory of tones. The participating teachers used body movements such as hand gestures and heads up and down to allow students to visualize the rhythm, contour, and variation of tones. Many students confused Tone 2 and Tone 3 with difficulty in accurately reading the descending trend of Tone 3. In such cases, teachers used hand gestures to indicate the three tones, while guiding the students' downward trend of tones through movements such as bowing their heads.

(1)

In the elementary classroom, the teacher's head, hands, and body are in constant movement as she conducts the teaching. When teaching Tone 3, the teacher's gestures also rise and fall according to the contours of the tone to facilitate recognition and imitation of the tone by the students. (The Field note, A1)

Complementary to the performance method is the demonstration method, by which the participants responded to tone errors by demonstrating the correct pronunciation and explaining the rules, so that students can imitate the standard pronunciation repeatedly, thus deepening their grasp of the tones. In the class, the participating teachers often use a combination of multiple approaches and select different methods to correct tones for students of different grades. The study found that teachers in elementary classes tended to use all three methods together to provide a comprehensive tone correction. The participants in the intermediate and pre-advanced classes largely stopped demonstrating tones. Instead they guided students to pronounce the words themselves through gestures and rule explanations. The participants are constantly imitating, learning, practising, and transferring to improve their own teaching skills, and constantly contributing to the improvement of their students' tone skills.

## 5. Discussion

### 5.1 The challenges from sociocultural environment in tones teaching

This study is rooted in CAL classes in Macau and its findings emphasize the impact of the sociocultural environment on the teaching of Chinese tones. In a multilingual environment, students have a more extensive array of language choices and 'fallbacks' compared to foreign students studying Mandarin

Chinese in Chinese mainland, as they can switch to English or Portuguese for communication if their proficiency in Mandarin Chinese is limited. Some students may lack a strong commitment to ‘I must work hard to study Mandarin Chinese’, which largely contributes to the difficulty of improving students’ tones. As a response to this, CAL teachers in Macau placed a greater emphasis on tones, delivering more frequent and stringent tone instruction. This increased focus on practising tones within the classroom served to heighten students’ awareness and motivation.

This study has revealed a dual impact of the Cantonese environment on Chinese tone instruction. On one hand, Cantonese, with its nine tones, proved beneficial in nurturing students’ tone awareness. However, on the other hand, prolonged exposure to or mastery of Cantonese led to confusion among some students when differentiating between tones, hindering their ability to accurately master Mandarin Chinese tones. This dual influence presents a significant challenge for teachers in the intricate language environment of Macau.

## 5.2 The Multiple Perspectives Analysis of Tone Teaching Strategies

Tones teaching in CAL has been a longstanding issue, and that it has garnered the attention of researchers across various countries and regions (Sun and Shouse 2016). Among the teaching difficulties encountered by CAL teachers, students’ tone confusion was prominent (Huang 2019). Research in this area is often carried out using phonological tests to analyse students’ tone problems. Previous studies on teachers’ strategies have mainly discussed the corrective feedback methods employed in the classroom, such as multimodality pedagogy. These discussions typically delve into the cognitive aspects of teaching (e.g. Wong *et al.* 2007; Peng 2019; Zhang 2019). Nevertheless, there has been limited in-depth studies on teaching strategies from the perspectives of emotional and behavioural dimensions. However, this study has highlighted the significant impact of students’ motivation and emotional tendencies on their ability to learn Chinese tones effectively. Consequently, this research systematically analyses and discusses the affective strategies that teachers employ in tone instruction.

In this study, we have confirmed that teachers promoted students’ acceptance and mastery of Chinese tones by giving positive feedback, paying attention to students’ individual needs, and adjusting evaluation standards flexibly in the teaching process. Through these strategies, teachers aim to stimulate students’ emotional engagement in learning Chinese tones. This approach helps students receive positive feedback as they progress, fosters a sense of accomplishment, and cultivates a genuine interest in mastering tones.

## 6. Conclusion

Using data derived from classroom observations and interviews, this study has pinpointed a range of challenges that CAL teachers face and a set of specific strategies they have implemented. The findings of this research carry significant theoretical and pedagogical implications, particularly concerning the effective teaching and learning of tones.

Three significant challenges stem from students' backgrounds, the teaching context, and the social environment. CAL teachers have reported various strategies to address these challenges, which can be categorized into three main perspectives: cognitive, affective, and behavioural. From the cognitive perspective, teachers employ strategies such as reinforcing students' comprehension and application of the 'tone' concept, shifting the instructional focus, and guiding students to distinguish between correct and incorrect tones. From the affective perspective, teachers aim to boost students' enthusiasm for learning by providing positive feedback and capitalizing on the existing language environment. From the behavioural perspective, teachers concentrate on combining traditional teaching methods with targeted instruction, with the goal of establishing Chinese tones as a form of muscle memory for students. These multifaceted strategies contribute to an effective approach in addressing the identified challenges.

These findings encompass the theoretical foundations of teachers' instructional methods and serve as a foundational resource for future research into teaching strategies from the teacher's perspective. In practice, this study carries significant pedagogical implications for teaching Chinese tones to foreign learners in the Macau context. It clarifies the current philosophy and rationale behind teachers' use of these strategies. The study acknowledges that teachers are aware of the existing challenges in tone instruction, but it reveals that many of the teaching methods are somewhat generic and may lack creativity. The feedback from this research offers teachers the opportunity to reflect on their current tone teaching approaches, allowing them to implement more targeted strategies in the Macau context. They can also explore new teaching methods and apply these insights throughout the entire process of teaching phonetics. In future teaching, this study suggests that teachers explore innovative classroom methods, such as flipped classroom approach to facilitate more in-depth communication and mutual learning among students and enhancing their learning interest. At the emotional level, teachers should also tailor their instruction to individual aptitudes, adapt evaluation flexibly, and improve students' learning motivation (Gong and Gao 2024).

Due to resource limitations and time constraints, the researcher primarily focused on observing elementary classes where tone instruction was more



prominent. Consequently, the classroom observations for other grade levels were relatively brief. Additionally, the restricted timeframe did not permit the researcher to obtain a comprehensive understanding of potential changes in teachers' strategies and attitudes over the course of their instruction. In future studies, improvements could be made in several aspects, including extending the study timeframe, allocating more resources, and broadening the selection of subjects, to offer a more comprehensive and nuanced perspective on tone instruction.

## About the Authors

Siyu Zhai is a master student at the Faculty of Education, University of Macau, Macau SAR, China. Her research interests include Chinese language education, teaching Chinese as an additional language (CAL).

Yang (Frank) Gong, PhD, is Assistant Professor at the Faculty of Education, University of Macau, Macau SAR, China. His research interests include Chinese education, language teacher education, intercultural education, and technology and language education. His publications have appeared in *Teaching and Teacher Education*, *Computers and Education*, *System*, *Language, Culture and Curriculum*, and so on. He now serves on the editorial board of *Language, Culture and Curriculum* (Taylor & Francis).

Luyao (Elva) Zhang is a doctoral student in the Faculty of Education at the University of Macau, Macau SAR, China. Her research interests include teacher identity, language teachers in higher education, teaching Chinese as an additional language (CAL). Her publications have appeared in *Journal of Multilingual and Multicultural Development*, *Higher Education Research and Development*, and so on.

## References

- Al-Ghazo, A. (2021) An exploration of teachers' perspectives towards cognitive, affective and linguistic teaching principles while teaching English as a foreign language. *Jordan Journal of Modern Languages and Literatures* 13(1): 17–40. <http://doi.org/10.47012/jjml.13.1.2>
- Alamri, W. A. (2019) Effectiveness of qualitative research methods: Interviews and diaries. *International Journal of English and Cultural Studies* 2 (1): 65–70. <https://doi.org/10.11114/ijecs.v2i1.4302>
- An, Z., Gong, Y., and Chen, M. (2024) The influence of language contact and ethnic identification on Chinese as a second language learners' oral proficiency. *International Review of Applied Linguistics in Language Teaching (IRAL)*, 1–22. <https://doi.org/10.1515/iral-2023-0221>
- Andrews, S. (2003) Teacher language awareness and the professional knowledge base of the L2 teacher. *Language Awareness* 12 (2): 81–95. <https://doi.org/10.1080/09658410308667068>



- Ao, Q. (2021) The sociocultural-cognitive underpinnings in error correction: A descriptive study on acquisition of Chinese tones. *International Journal of Chinese Language Teaching* 2 (2): 44–72. <https://doi.org/10.46451/ijclt.2021.10.04>
- Bao, R. (2019) Oral corrective feedback in L2 Chinese classes: Teachers' beliefs versus their practices. *System* 82: 140–150. <https://doi.org/10.1016/j.system.2019.04.004>.
- Bao, R. and Du, X. (2015) Implementation of task-based language teaching in Chinese as a foreign language: Benefits and challenges. *Language, Culture and Curriculum*, 28(3): 291–310. <https://doi.org/10.1080/07908318.2015.1058392>
- Beatty, J. E., Leigh, J. S., and Lund Dean, K. (2009) Finding our roots: An exercise for creating a personal teaching philosophy statement. *Journal of Management Education* 33 (1): 115–130. <https://doi.org/10.1177/1052562907310642>
- Birt, L., Scott, S., Cavers, D., Campbell, C., and Walter, F. (2016) Member checking: A tool to enhance trustworthiness or merely a nod to validation? *Qualitative Health Research* 26 (13): 1802–1811. <https://doi.org/10.1177/1049732316654870>
- Brown, D. (2007) *Teaching by Principles: An Interactive Approach to Language*. New York: Prentice Hall.
- Chen, T. H. and Massaro, D. W. (2008) Seeing pitch: Visual information for lexical tones of Mandarin-Chinese. *The Journal of the Acoustical Society of America* 123 (4): 2356–2366. <https://doi.org/10.1121/1.2839004>
- Cherry, K. (2018) Attitudes and behavior in psychology. *Verywell Mind*, 1-5. Available at: <https://www.verywellmind.com/attitudes-how-they-form-change-shape-behavior-2795897>
- Creswell, J. W. (2014) *Research Design: Qualitative, Quantitative and Mixed Methods Approaches* (4th ed.). London: Sage.
- Ericsson, K. A. (2004) Deliberate practice and the acquisition and maintenance of expert performance in medicine and related domains. *Academic Medicine* 79(10): 70–81.
- Ghafur, A. and Ulfa, S. M. (2021) A case study of how speaking skill taught to EFL students in junior high school level. *SELL (Scope of English Language Teaching, Linguistics, and Literature) Journal* 6 (2): 128–147.
- Godfroid, A., Lin, C. and Ryu, C. (2017) Hearing and seeing tone through color: An efficacy study of web-based, multimodal Chinese tone perception training. *Language Learning* 67 (4): 819–857. <https://doi.org/10.1111/lang.12246>
- Gong, Y. and Gao, X. (2024) Language teachers' identity tensions and professional practice in intercultural teaching. *Language Teaching Research*. <https://doi.org/10.1177/13621688241241125>
- Gong, Y. and Zhang, H. (2023) Special issue editorial: Teaching and learning Chinese as a heritage language (CHL). *Researching and Teaching Chinese as a Foreign Language* 4(1): 41–48. <https://doi.org/10.1558/rtcf.26367>
- Gong, Y., Gao, X., Li, M., and Lai, C. (2021) Cultural adaptation challenges and strategies during study abroad: New Zealand students in China. *Language, Culture and Curriculum* 34 (4): 417–437. <https://doi.org/10.1080/07908318.2020.1856129>
- Gong, Y., Gao, X., and Lyu, B. (2020) Teaching Chinese as a second or foreign language to non-Chinese learners in mainland China (2014–2018). *Language Teaching* 53 (1): 44–62. <https://doi.org/10.1017/S0261444819000387>

- Gong, Y., Lyu, B., and Gao, X. (2018) Research on teaching Chinese as a second or foreign language in and outside mainland China: A bibliometric analysis. *The Asia-Pacific Education Researcher* 27 (4): 277–289. <https://doi.org/10.1007/s40299-018-0385-2>
- Gong, Y., Zheng, Y., and Gao, X. (2023). Portuguese language learning and capital access: A study on university students in Macau. *Porta Linguarum* 8: 133–149. <https://doi.org/10.30827/portalin.viVIII.29243>
- Huang, H. (2019) Understanding tertiary Chinese language learners' needs: A cross-curricular perspective. In F. Farr and L. Murray, L. (eds) *The Routledge Handbook of Chinese Language Teaching*, 375–392. London: Routledge.
- Jiang, X. and Cohen, A. D. (2012) A critical review of research on strategies in learning Chinese as both a second and foreign language. *Studies in Second Language Learning and Teaching* 2 (1): 9–43. <http://dx.doi.org/10.14746/ssl.t.2012.2.1.2>
- Kim, D. (2020) Learning language, learning culture: Teaching language to the whole student. *ECNU Review of Education* 3 (3): 519–541. <https://doi.org/10.1177/2096531120936693>
- Lam, J. F. and Leong, W. I. (2022) Translanguaging and multilingual society of Macau: Past, present and future. *Asian-Pacific Journal of Second and Foreign Language Education* 7 (1): 1–15. <https://doi.org/10.1186/s40862-022-00169-y>
- Lee, W. S. and Zee, E. (2014) Chinese phonetics. In C. J. Huang, Y. A. Li, and A. Simpson (eds) *The Handbook of Chinese Linguistics*, 367–399. John Wiley & Sons.
- Li, V. M., Dessein, B., Badan, L., and Anderl, C. (2021) Pedagogical content knowledge: A systematic review of Chinese language pronunciation teaching in the CFL context. *Foreign Language Annals* 54 (2): 525–557. <https://doi.org/10.1111/flan.12558>
- Li, Y. (2016) English and Thai speakers' perception of Mandarin tones. *English Language Teaching* 9: 122–132. <https://doi.org/10.5539/elt.v9n1p122>
- Liu, Y., Wang, M., Perfetti, C. A., Brubaker, B., Wu, S., and MacWhinney, B. (2011) Learning a tonal language by attending to the tone: An in vivo experiment. *Language Learning* 61 (4): 1119–1141. <http://dx.doi.org/10.1111/j.1467-9922.2011.00673.x>
- Ma, X., Gong, Y., Gao, X., and Xiang, Y. (2017). The teaching of Chinese as a second or foreign language: A systematic review of the literature 2005–2015. *Journal of Multilingual and Multicultural Development* 38 (9): 815–830. <https://doi.org/10.1080/01434632.2016.1268146>
- Migiro, S. and Oseko, A. (2010) Qualitative research paradigms: What the novice researcher needs to know. *Proceedings of the European Conference on Research Methods for Business & Management Studies* 12(1): 334–341.
- Ministry of Education of PRC. (2021) Letter of response to Proposal No. 2624 (Education No. 091) of the Fourth Session of the 13th National Committee of the Chinese People's Political Consultative Conference. [http://www.moe.gov.cn/jyb\\_xxgk/xxgk\\_jyta/yuhe/202111/t20211104\\_577702.html](http://www.moe.gov.cn/jyb_xxgk/xxgk_jyta/yuhe/202111/t20211104_577702.html).
- Moody, A. (2019). Educational language policy in Macau: Finding balance between Chinese, English and Portuguese. In A. Kirkpatrick and A. J. Liddicoat (eds.) *The Routledge International Handbook of Language Education Policy in Asia*, 76–96. London: Routledge.
- Morett, L. M. and Chang, L.-Y. (2015) Emphasizing sound and meaning: pitch gestures enhance Mandarin lexical tone acquisition. *Language, Cognition and Neuroscience* 30 (3): 347–353. <https://doi.org/10.1080/23273798.2014.923105>

- Nel, N. M. and Soezin, K. R. O. G. (2021) Factors influencing the acquisition of Mandarin Chinese as a second additional language focusing on phonetics. *Participatory Educational Research* 8 (1): 1–27. <https://doi.org/10.17275/per.21.1.8.1>
- Peng, J. E. (2019) The roles of multimodal pedagogic effects and classroom environment in willingness to communicate in English. *System* 82: 161–173. <https://doi.org/10.1016/j.system.2019.04.006>
- Peng, R. and Fu, R. (2021) The effect of Chinese EFL students' learning motivation on learning outcomes within a blended learning environment. *Australasian Journal of Educational Technology* 37 (6): 61–74. <https://doi.org/10.14742/ajet.6235>
- Rubin, J. (1994) A review of second language listening comprehension research. *The Modern Language Journal* 78(2): 199–221. <https://doi.org/10.2307/329010>
- Smith, E. B. (2009) Approaches to multicultural education in preservice teacher education: Philosophical frameworks and models for teaching. *Multicultural Education* 16 (3): 45–50. <http://caddogap.com/periodicals.shtml>
- Sumardani, D. and Dujali, C. C. (2021) Teaching philosophy statement for physics teachers: Let's think about. *Jurnal Pendidikan IPA Indonesia* 10(3): 325–335. <https://doi.org/10.15294/jpii.v10i3.28571>
- Sun, J. A. and Shouse, R. (2016) US policies and initiatives for CFL education. In J. Ruan, J. Zhang, and C. B. Leung (eds.) *Chinese Language Education in the United States*, 47–62. London: Springer.
- Sung, K. Y. and Tsai, H. M. (2014) Exploring student errors, teachers' corrective feedback, learner uptake and repair, and learners' preferences of corrective feedback. *The Journal of Language Learning and Teaching* 4 (1): 37–54.
- Tellier, M. (2008) The effect of gestures on second language memorization by young children. *Gesture* 8(2): 219–235. <https://doi.org/10.1075/gest.8.2.06tel>
- Tse, S. K. and Cheung, W. M. (2010) Chinese and the learning of Chinese. In *On the learning of Chinese*, 1–7. Leiden: Brill.
- Wang, M., Perfetti, C. A. and Liu, Y. (2003) Alphabetic readers quickly acquire orthographic structure in learning to read Chinese. *Scientific Studies in Reading* 72: 183–207. [https://doi.org/10.1207/S1532799XSSR0702\\_4](https://doi.org/10.1207/S1532799XSSR0702_4)
- Wong, P. C. M., Skoe, E., Russo, N. M., Dees, T., and Kraus, N. (2007) Musical experience shapes human brainstem encoding of linguistic pitch patterns. *Nature Neuroscience* 10: 420–422. <https://doi.org/10.1038/nn1872>
- Wu, H., Ma, X., Zhang, L., Liu, Y., Zhang, Y., and Shu, H. (2015) Musical experience modulates categorical perception of lexical tones in native Chinese speakers. *Frontiers in Psychology* 6: 436. <https://doi.org/10.3389/fpsyg.2015.00436>
- Xu, W. and Zammit, K. (2020) Applying thematic analysis to education: A hybrid approach to interpreting data in practitioner research. *International Journal of Qualitative Methods* 1–9. <https://doi.org/10.1177/1609406920918810>
- Yang, X., Wang, Y., Xu, L., Zhang, H., Xu, C., and Liu, C. (2015) Aging effect on Mandarin Chinese vowel and tone identification. *The Journal of the Acoustical Society of America* 138 (4): EL411–EL416. <https://doi.org/10.1121/1.4933234>
- Zhang, L. (2019) Tone features of Chinese and teaching methods for second language learners. *International Journal of Chinese Language Education* 5: 45–66.