Project Title	**:**	Facilitating Non-Chinese Speaking (NCS) Students' Chinese Literacy Development: An Evidence-Based Approach
Grantee	**:**	The Chinese University of Hong Kong
Principal Investigator	**:**	BAI Barry The Chinese University of Hong Kong
Co-Investigator(s)	**:**	WONG Yu-ka, Gary University of Glasgow

Final Report

by

Principal Investigator

Facilitating non-Chinese speaking (NCS) students' Chinese literacy development: An evidence-based approach

Abstract

This study delved into the efficacy of the "Chinese Literacy Delight" intervention, aimed at enhancing Chinese literacy among Grade 1 Non-Chinese Speaking (NCS) students over a two-year longitudinal span. Employing a quasi-experimental design, the research assessed the progression of students' literacy skills across three pivotal time points. Four primary schools participated, with a cohort of 115 students completing the program. The intervention integrated evidence-based instructional materials tailored to the unique needs of NCS students, emphasizing orthographic, phonological, and morphological awareness. Results showcased significant improvements in Chinese character reading, phonological awareness, and listening comprehension. By contrast, morphological awareness remained relatively stagnant, indicating potential areas for curriculum enhancement. Orthographic awareness emerged as increasingly dominant by the study's end, underscoring its escalating importance as students progress. The consistent significance of listening skills highlighted the indispensable symbiosis between oral and written language. Overall, the "Chinese Literacy Delight" intervention demonstrated promising results, illuminating pathways for future instructional strategies, and affirming the potential for achieving Chinese literacy proficiency among NCS students.

Keywords : Chinese Literacy Intervention, Non-Chinese Speaking (NCS) Students, Metalinguistic Awareness

Introduction

Formal instruction is crucial to the successful development of children's reading skills, which lay the foundation for the lifelong development of literacy skills that are integral in both school and life. Thus, many studies have been conducted that aim to improve children's early literacy instruction (National Reading Panel, 2000). For immigrant learners who are learning a dominant second language (L2), the success of literacy instruction has a major influence on social integration and educational advancement (August & Shanahan, 2008). This issue is of particular concern for non-Chinese speaking (NCS) ethnic minority students in Hong Kong whose families are primarily from South Asian countries such as India, Nepal, and Pakistan. Constituting approximately 2.5% of primary and secondary schools' student populations, these students' Chinese language proficiencies, especially in reading and writing, are generally far lower than those of their native Chinese-speaker counterparts (Wong & Wong, 2021), which has a detrimental effect on their academic advancement (Loh & Tam, 2016). Their teachers, who are primarily mainstream Chinese-language teachers without formal CSL instruction training, also face challenges in literacy teaching. Reflecting the call for adopting evidence-based instruction in English reading (McCardle & Miller, 2009), researchers have expressed concerns that Chinese teachers should have access to CSL instruction strategies that are derived from research and supported by proven results (Li & Chuk, 2015; Wong, 2019).

Literacy acquisition problems like those faced by ethnic minority students in Hong Kong are observed in CSL learners worldwide. China's growing global influence has been matched by a growth of interest outside China in learning the Chinese language. However, Chinese is considered a difficult foreign language due to its various distinctive linguistic characteristics (Everson 2002). Chinese is a morpho-syllabic, tonal language with Chinese characters as basic units of its writing system. Each Chinese character is a two-dimensional,

visual–spatial unit that mostly stands for a syllable and functions as a morpheme representing certain meanings (Cheung, McBride-Chang, & Chow, 2006). While some CSL learners found the tonal phonology a learning difficulty (Liu, 2002), almost all of them faced even greater difficulty in acquiring the unique, complex Chinese orthographic system (Shen, 2005).

Review of literature of the project

NCS students' literacy development

The Chinese writing system has three levels: the stroke, the componential chunk, and the full character. The componential chunks, chiefly formed by clusters of strokes, are the basic constituent units of characters (Su, 2001; Qian, Song, Zhao, & Bi, 2015); radicals are those chunks that have semantic and/or phonetic functions (Xu, Chang, & Perfetti, 2014). Ideo-phonetic compounds comprise a majority of modern characters composed of a semantic radical cueing meaning and a phonetic radical indicating pronunciation, positioned within a character as left–right (e.g. 晴), top–down (e.g. 忘), or 'surrounding' (e.g. 園) spatial arrangements. As for these characteristics, studies on both CSL and native Chinese-speaking learners have identified various linguistic correlates of Chinese literacy acquisition (e.g. Lam & McBride, 2018; Leong, Tse, Loh, & Ki, 2011; Shen, 2005; Shen & Ke, 2007; Tong & Yip, 2015; Yeung et al., 2013).

The sophisticated Chinese writing system has posed a major learning hurdle to NCS students. With a series of studies on NCS students' Chinese-language development, the PI has identified specific metalinguistic awareness types related to their Chinese literacy development. Wong (2017b) found that the students' Chinese orthographic knowledge and componential awareness are important for their Chinese character reading and development. In turn, the students' Chinese decoding competence, comprising both orthographic processes and character reading, has been found to be a strong predictor of their reading comprehension

performance and development throughout their senior primary years, when the influence of listening comprehension is controlled (Wong, 2017a, 2019). Moreover, Wong (2018b) observed a strong CSL reading–listening comprehension relationship, which may be accounted for by the role morphological awareness plays in manipulating words' morphological information. As for the students' writing development, Wong (2018a) determined that the students' character writing fluency and written syntactic awareness are two significant skills that account for a strong reading–writing relationship.

In sum, the studies have shown the importance of oral language and various types of metalinguistic awareness (orthographic, phonological, and morphological) on NCS students' Chinese literacy development.

Evidence-based intervention for CSL literacy learning

Informed by this body of research, the PI has conducted an intervention study, funded by SCOLAR (Project number: EDB(LE)/P&R/EL/175/11), to facilitate Hong Kong senior-primary NCS students' Chinese literacy by cultivating these various aspects of metalinguistic awareness. The intervention, entitled Foundational Chinese Literacy Skills Instruction, stresses improving (1) Chinese orthographic conventions, such as Chinese characters' sub-components and compositional regularity; (2) students' phonological and morphological awareness, by emphasising orthographic differences among Chinese homophones, morphological word analysis (how characters combine to form words), and shape-to-meaning connections in characters; and (3) students' oral language skills, which are foundational to literacy. The interventions were implemented in the students' Chinese lessons in Grades 4 and 5, and teachers were provided with instructional packages that included lesson plans and learning materials to help them implement the intervention. The results supported the effectiveness of the Foundational Instruction intervention in developing young CSL students'

Chinese reading comprehension via explicit and systematic progressive instruction on core metalinguistic awareness, decoding and linguistic comprehension skills (Wong et al., 2023).

Aligning with previous studies' findings, the project's pre-treatment assessments (Wong, 2020b) found that, firstly, CSL students' performance was significantly lower than their native-speaker counterparts', particularly in Chinese reading and spelling. Secondly, the students' Chinese orthographic, phonological, and morphological awareness significantly contributed to their Chinese reading and spelling, and most of their metalinguistic awareness types accounted for a statistically significant, unique portion of variances in character reading and dictation, respectively. These assessment results facilitated the development of effective interventions for the project.

As reported in Wong (2020c), the project's preliminary findings supported the intervention's effectiveness. In a range of linguistic measures covering Chinese orthographic, phonological, and morphological awareness, and character reading and spelling, the students in the treatment group exhibited greater improvement than those in the control group in all competences except phonological awareness, when controlling for pre-test attainments. The treatment effects, as indicated by the partial eta-squared (ηp2) values, were as follows: orthographic awareness: $\eta p2 = .040$, $p < .01$; morphological awareness: $\eta p2 = .022$, $p < .05$; character reading: $\eta p2 = .037$, $p < .01$; and spelling: $\eta p2 = .070$, $p < .01$. The findings supported the intervention's effectiveness in developing CSL students' Chinese literacy skills (character reading and spelling) by promoting their orthographic and morphological knowledge and awareness.

Theoretical and/or conceptual framework of the project

The present study is proposed with the aim of extending the PI's previous intervention study to facilitate Grade 1 NCS students' Chinese literacy acquisition and development with

evidence-based instruction. Studies investigating young CSL learners' early Chinese literacy development are scarce and our understanding is far from adequate. As Wang et al. (2018), Zhou and McBride (2015), and Zhou et al. (2018) found among junior-primary NCS students, while similar linguistic Chinese literacy acquisition correlates were identified in both NCS students and their Chinese-speaking counterparts, the CSL students relied more heavily on their Chinese phonological awareness skills and, to some extent, their visual-orthographic skills. Young NCS students', particularly first-graders', unclear Chinese-language developmental trajectory posed major instructional challenges for their teachers.

In view of this, the PI has recently conducted a research project to explore CSL literacy development in Hong Kong's NCS students across grade levels by comparing them to their Chinese-speaking counterparts (Wong & Wong, 2021). It was found that while Grade 4 NCS students performed significantly weaker than Grade 4 CNL students, their performance was similar to first-graders in character reading, listening comprehension, and orthographic awareness. Grade 1 NCS students' performance lagged far behind their CNL counterparts. The results also revealed that (1) orthographic knowledge is important for both NCS and CNL students and (2) for NCS students, the development of basic literacy skills is closely related to receptive oral language competence. Particularly, the results indicated that young NCS learners exhibited significant deficits in basic character reading, which must be detrimental to their long-term literacy development. These results clearly indicated the necessity of providing these students with improved literacy instruction. To this end, the present study is proposed with the following aims:

1. Facilitate Grade 1 NCS students' Chinese literacy acquisition and development, with evidence-based instruction; and,

2. Identify linguistic competencies that contribute to NCS junior-primary students'

Chinese literacy development and examine the course of their developmental trajectory.

Methodology

The proposed study used a 2-year longitudinal, quasi-experimental design in which an evidence-based intervention was developed, implemented, and evaluated in four primary schools' junior-primary Chinese language classrooms. Using the instructional materials that have been developed, with proven success under the PI's previous intervention study, a new intervention that is tailored to Grade 1 NCS students' learning needs will be developed and implemented during their second Grade 1 school term and their first Grade 2 school term. Student progress in character reading and writing, as well as related metalinguistic skills, was tracked at three different time points. The effectiveness of the intervention was assessed using a variety of assessments focusing on Chinese language and literacy competences. Additionally, the students' pre-treatment Chinese competence was assessed as baseline data for subsequent analyses. This baseline data served as a reference point for further evaluation and interpretation of the intervention's impact.

Participating schools and students

Four schools participated in the intervention study, all of which cater to a significant population of NCS (Non-Chinese Speaking) students and possess extensive experience in delivering education to ethnic minority children. Each of these schools has devised a school-based Chinese language curriculum specifically tailored to meet the unique learning requirements of their NCS students, utilising simplified learning materials. At the outset of the study, a total of 122 students enrolled, but by the study's conclusion, 115 students successfully completed all assessments conducted at the three designated time points.

Evidence-based Chinese literacy instruction

The evidence-based literacy program that has been developed is named "Chinese

Literacy Delight" (識字樂 in Chinese). This program comprises two main parts. In Part One, there is a total of 96 simple characters, which are characters consisting of only one radical. In Part Two, there is a collection of 44 compound characters, each featuring a commonly-used semantic radical. It is worth emphasising that this program was crafted using the instructional package features that were successfully employed in a previous intervention study. These features have been thoughtfully tailored to meet the specific needs of students at the early CSL (Chinese as a Second Language) literacy stage. The key features include the following:

(1) An oral language emphasis: the intervention emphasises the importance of building a strong oral language foundation for students' Chinese literacy development. Wong & Wong (2021) showed that Grade 1 NCS students lagged behind in Chinese oral competences compared to their CNL counterparts and that this severely impeded their literacy acquisition. Following the practices of the previous intervention study (Wong et al., 2023), the two key oral competences to be developed are oral vocabulary and listening comprehension. The previous project has provided us with a vocabulary set that was taught in the NCS students' senior-primary Chinese classroom; the set facilitated the development of materials for this instruction component.

(2) Metalingustically-focused: this refers specifically to two types of awareness that our studies (Wong, 2020b, 2020c; Wong & Wong, 2021) found to be related to NCS students' Chinese literacy, i.e. morphological and phonological awareness, as well as being built on students' Chinese oral language foundation. Since each Chinese character generally stands for a syllable and a morpheme, learners' awareness of the syllable and the morpheme would facilitate their learning of characters. Following the previous project's practices, the instruction will stress the morphological analysis of words (i.e. deconstructing the word compounds/phrases) that are commonly used in their Chinese lessons and how the characters (units representing a syllable and a morpheme) are connected to form words/phrases. The

materials for this instruction component are delivered in a meaningful context and in a manner that avoids the use of abstract linguistic terms that are incomprehensible to young learners.

(3) Orthographic-based: This is the major component of the instruction, for which the former two components serve as foundation and support. The instruction will stress (1) teaching a set of 140 high-learning-priority simple and compound characters, that is, 96 simple characters (e.g. 心) and 44 compound characters (e.g. 想, 忘) that the previous intervention study (Wong, 2020b, 2020) identified as essential and facilitative in students' Chinese literacy development; and along with character acquisition, (2) instruction on Chinese orthographic knowledge and conventions. For this aspect, the previous project of Wong et al. (2023) has provided a rich source of instructional materials, including (a) basic concepts of the Chinese writing system such as characters' structural properties, (b) radical knowledge including commonly-used semantic radicals and their meanings/functions, and the use of phonetic radicals to categorise and memorise a group of compound characters (e.g. from the phonetic radical of 青 is derived the set of compounds 清, 晴, 睛, 請, 情), and (c) the spatial–positional relationships of the components within a character, including left–right, top–down, and surrounding. Character copying, which McBride and Wang (2015) and the previous intervention studies (Wong, Zhou, & McBride, 2020; Wong et al., 2023) found to be an effective learning strategy for Chinese literacy acquisition, is integrated as an exercise in this component as well.

Following the previous intervention study's practices (Wong et al., 2023), the instruction was incorporated into Chinese lessons at participating schools. In order to blend the lessons seamlessly for maximum learning effectiveness, the Chinese curricula for Grades 1 and 2 were reviewed. The PI has the advantage of gaining a good understanding of all the

schools' Chinese curricula by implementing the previous study. The instruction took 15 to 20 teaching hours, spanning a 3-month school term. The implementation of the instruction was in the second term of Grade 1 and the two school terms of Grade 2.

Evaluating the instruction's effectiveness

The assessment of students' Chinese language and literacy competences was carried out using measures that were previously developed and validated in Wong's studies (2020a, b, c; Wong et al., 2020). Data collection encompassed three waves, including one pre-treatment assessment conducted during the first term of Grade 1, followed by two post-treatment assessments during the Grade 2 school year. The measures are as follows:

1. Orthographic awareness. The orthographic awareness test consists of two parts: assessing the students' visual–orthographic sensitivity to Chinese characters and their awareness of the semantic radicals' representational functions. Part 1 is a radical perception test (comprising 9 items) that requires the students to divide a compound character into two immediate componential radicals. Part 2 (comprising 10 items) assesses the participants' skill in using the information provided by the semantic radical to decode a novel character. The participants were shown a picture (provided with an English illustration) and were required to choose the novel character with the meaning that best matched the picture from three options. All of the characters will be novel to the ethnic minority student participants since they are at the Grade 6 level, according to Pan and Kang's study (2003), and their Chinese teachers confirmed that none of the words had been covered in their Chinese lessons.

2. Phonological awareness. The test has two sections: assessing the participants' phonological sensitivity at the syllabic and sub-syllabic (i.e. onset/rime/tone) levels, respectively. In Part 1 (comprising 9 items), the participants were required to reproduce a Chinese word/phrase minus one of the syllables, e.g. removing the syllable /luk6/ (綠, green)

from the word /hung4 luk6 dang1/ (紅綠燈, traffic light) and reproducing /hung4 dang1/. The Part 2 items (comprising 8 items) have an‘odd-man-out’format. The students were required to identify a syllable with a systematic difference from the rest, among four options.

3. Morphological awareness. The test comprises two sections. In Part 1, there are five items designed to assess homophone judgment using the 'odd-man-out' format. Here, students were tasked with identifying a homophone with a different meaning among three options. Part 2 involves a morphological construction task with seven items aimed at evaluating students' awareness of Chinese word compounding conventions. In each item, students were presented with a novel scenario or concept and provided with two to three options of newly-formed word compounds. For instance, a question might present a situation like, "牛在跳舞叫甚麼好?" ("How should we name a dancing cow in Chinese?") with two options, '牛舞 (cow-dance)' and '舞牛 (dance-cow).' The correct answer, '舞牛,' adheres to the Chinese word compounding convention of placing the descriptive noun 舞 (dance) before the main noun 牛 (cow).

4. Oral vocabulary and listening comprehension. The listening comprehension test was taken from a local standardised test, namely the Hong Kong Attainment Test (HKAT) (Educational Research Section of the Hong Kong Education Department, 1989a, b, 1999a, b), and a school-based Chinese language listening test that the Curriculum Development Institute of the Hong Kong Education Bureau (2011) developed for junior-primary ethnic minority students. The test consists of two parts. Part 1 is an oral vocabulary test of 12 items, in which the students were required to match a picture with a targeted word that was given in a simple context, e.g. ‘Tom is a teacher. What does Tom do for a living?’ Part 2 comprised 10 multiple choice questions on some listening material content to assess the students’ comprehension ability. The wave-1 test exclusively featured Part 1 due to the participants' limited listening

skills. In contrast, the subsequent tests in wave 2 and 3 included both parts, offering a more comprehensive evaluation of oral vocabulary and listening comprehension skills.

5. Chinese character reading. The Chinese character reading test consists of test items as single characters or two-character words. Chinese characters at the Grade 1 level were selected with reference to Pan and Kang's study (2003) on the use of Chinese characters in Hong Kong primary schools. All items were also verified against a list of basic Chinese words; the list was prepared for Hong Kong primary students (The Chinese Language Education Section of the Hong Kong Education Bureau, 2008) to ensure that the words are at the junior-primary level. Among the 100 items that were chosen in total, 50 were single characters and 25 were two-character words. The test was designed as an individual test, and the students were required to read out the characters one by one and follow the test administrator's instructions. Each correct pronunciation was awarded one mark.

Data analysis

In pursuit of the first research aim, centred on enhancing the Chinese literacy acquisition and development of Grade 1 NCS students through evidence-based instruction, we conducted an assessment of the students' Chinese literacy skills. This comprehensive evaluation encompassed Chinese character reading, in addition to their listening comprehension skills and metalinguistic abilities in orthography, phonology, and morphology. This assessment was carried out using repeated-measures t-tests, and we visually tracked the rate of progress through graphical representations. Turning to the second research aim, which involves identifying the linguistic competencies contributing to the Chinese literacy development of NCS junior-primary students and examining the trajectory of their development, we employed multiple regression analysis. This analysis allowed us to evaluate the influence of metalinguistic skills and listening competence on character reading and to

model the developmental trajectory of CSL (Chinese as a Second Language) literacy among the students.

Results and Discussion

The progress of the students' Chinese literacy skills

Table 1 presents the descriptive statistics for all measures collected during the three waves of data collection. Figures 1 to 5 illustrate the developmental trajectories of the students' Chinese language and literacy competences. The results reveal several key observations: (1) Chinese character reading (Figure 1), a pivotal indicator of Chinese literacy learning in this study, exhibited a consistent and steady upward trajectory, indicating significant progress over time. (2) Phonological awareness (Figure 3) also displayed a similar positive trend, with noticeable improvement over the course of the study. (3) In the case of orthographic awareness (Figure 2) and listening comprehension (Figure 5), limited progress was evident by Time 2, but there was a notable and substantial improvement by Time 3. (4) However, in the domain of morphological awareness, students' performance remained relatively stable across the different time points, showing no remarkable development or improvement.

Table 1

Descriptive statistics for all measures used in the study (N = 115)

Measures (max score)	Range	Mean	*SD*
Wave 1			
Chinese character reading (100)	0–76	13.50	15.90
Orthographic awareness (19)	2–19	10.07	3.18
Phonological awareness (17)	0–15	5.90	3.50
Morphological awareness (13)	0–10	4.75	1.97
Listening comprehension (12)	1–12	5.93	2.35
Wave 2			
Chinese character reading (100)	0–85	17.98	18.46
Orthographic awareness (19)	3–19	9.87	3.12
Phonological awareness (17)	0–15	7.95	3.28
Morphological awareness (13)	0–10	4.92	2.10
Listening comprehension (22)	4–21	11.32	3.85
Wave 3			
Chinese character reading (100)	0–89	23.03	21.19
Orthographic awareness (19)	5–19	13.19	3.74
Phonological awareness (17)	0–15	9.26	2.97
Morphological awareness (13)	0–10	4.67	1.84
Listening comprehension (22)	4–22	12.86	4.65

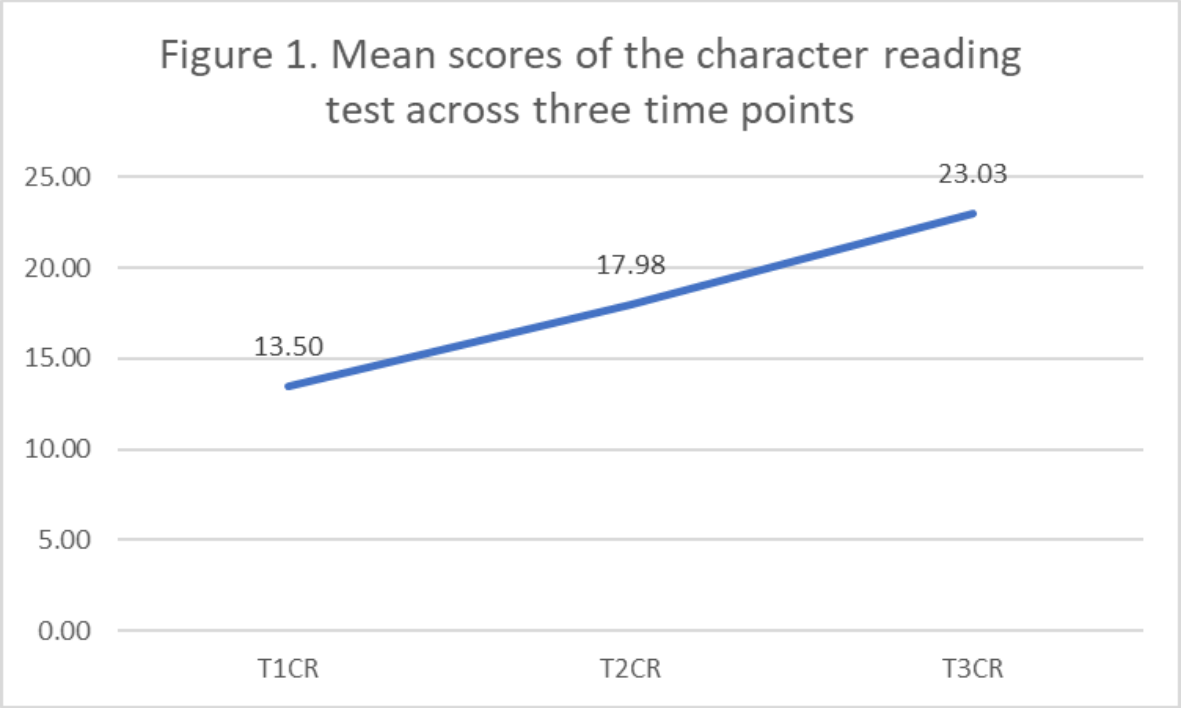


Figure 1. Mean scores of the character reading test across three time points
25.00
20.00
15.00
10.00
5.00
0.00
13.50
17.98
23.03
T1CR
T2CR
T3CR

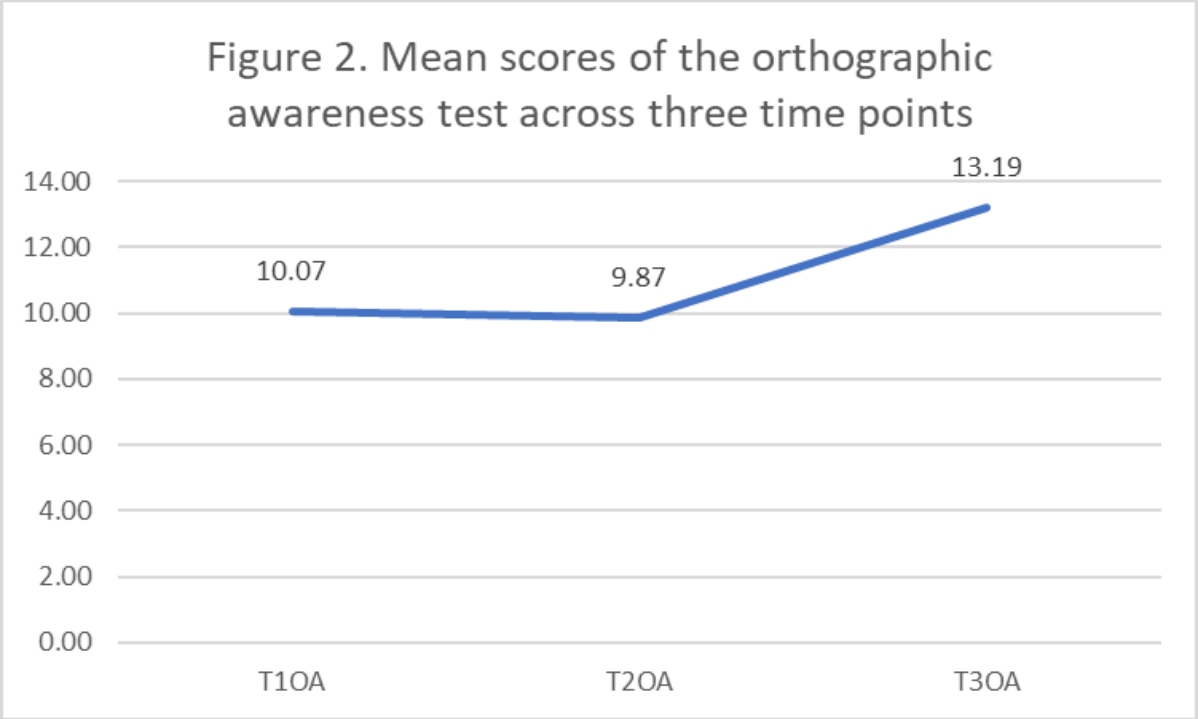


Figure 2. Mean scores of the orthographic awareness test across three time points
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
10.07
9.87
13.19
T1OA
T2OA
T3OA

Figure 3. Mean scores of the phonological awareness test across three time points

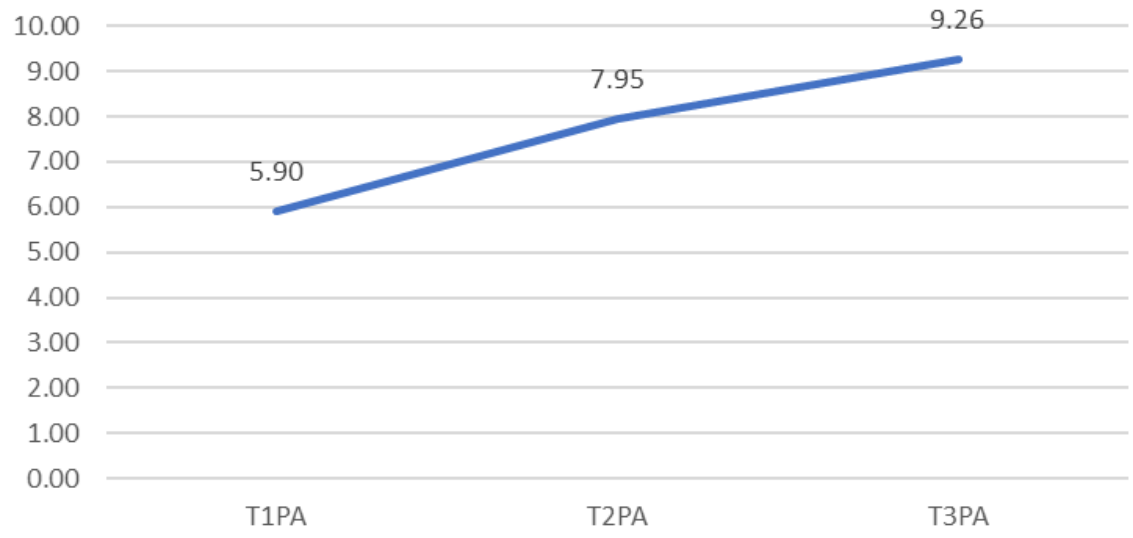
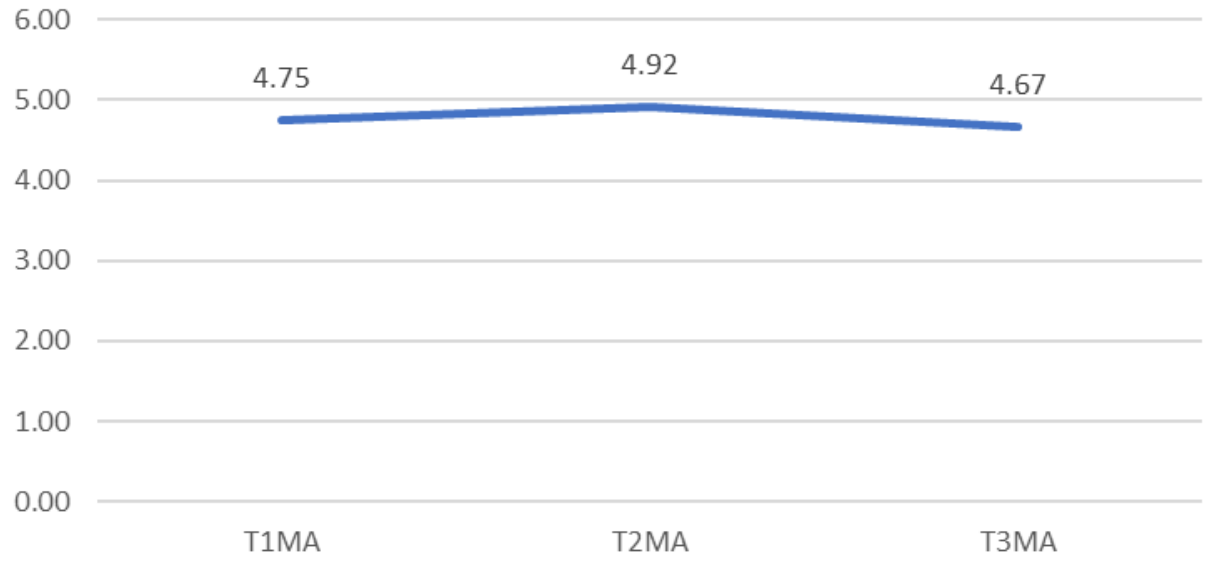
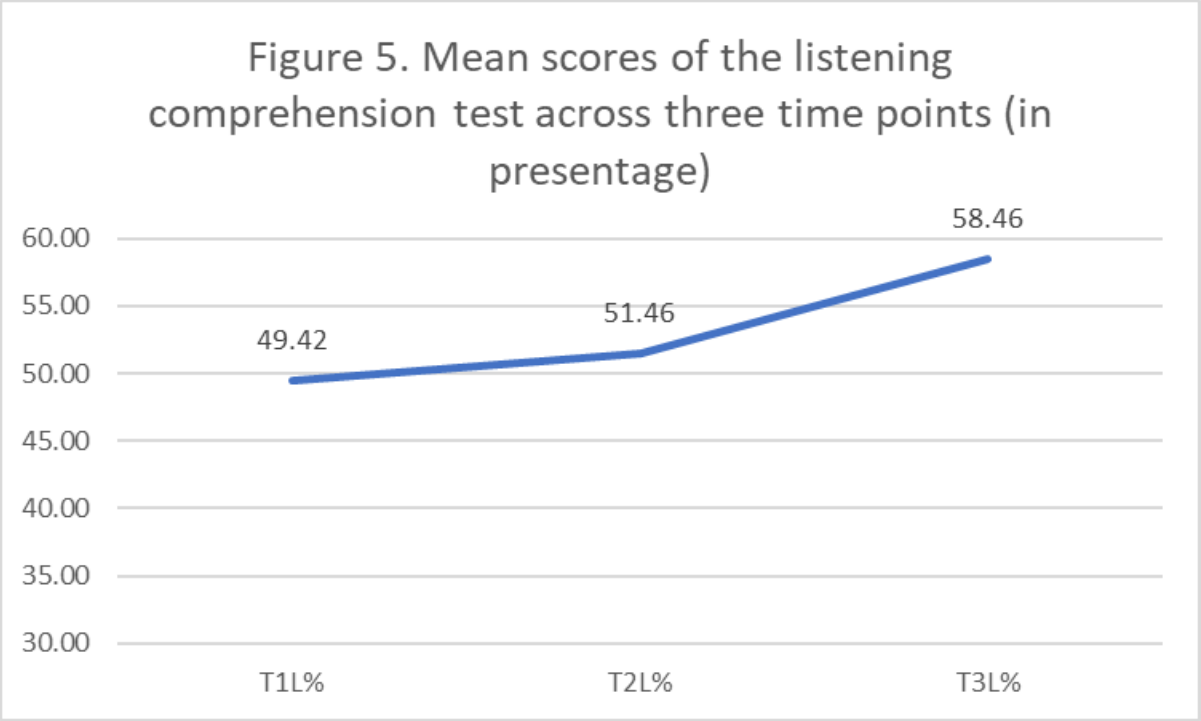


Figure 4. Mean scores of the morphological awareness test across three time points





The progression of the students' Chinese language and literacy development was further analysed using t-tests. As displayed in Table 2, the outcomes of these t-tests broadly substantiated the trends presented in Figures 1 to 5. The average score improvements across Time 1 to 2 and Time 2 to 3 were statistically significant for most measures, underscoring the effectiveness of the intervention program. Notably, statistically significant improvements were observed in all measures except for orthographic awareness and morphological awareness during Time 1 to 2, and morphological awareness during Time 2 to 3. These findings collectively reinforce the overarching trend of increasing proficiency in Chinese language and literacy among the students.

Table 2

Results of t-test on the differences between Time 1 to 2 and Time 2 to 3.

Measures	Time 1 – Time 2		Time 2 – Time 3	
	t (*df*=114)	95% CI for Mean Difference	*t* (*df*=114)	95% CI for Mean Difference
Chinese character reading	3.87**	2.19 – 6.78	6.24**	3.45 – 6.66
Orthographic awareness	-0.65	-0.81 – 0.41	10.15**	2.67 – 3.97
Phonological awareness	6.91**	1.46 – 2.64	4.40**	0.72 – 1.91
Morphological awareness	0.84	0.58 – 0.84	-1.32	-0.63 – 1.25
Listening comprehension	1.20*	4.78 – 6.00	4.69**	0.89 – 2.19

** $p < .01$, * $p < .05$

Overall, the data suggests promising advancements in Chinese literacy skills among the students, particularly in Chinese character reading, phonological awareness, and listening comprehension. This progress is indicative of the potency of the intervention and its alignment with the literacy development needs of the students. In particular,

Chinese Character Reading: A consistent upward trajectory in character reading suggests that students are progressively internalizing the intricacies of Chinese characters. This growth might be attributed not just to the exposure to characters but also to the

systematic approach the intervention might have adopted. The study's focus on breaking down characters into their constituent radicals and components could have facilitated a deeper understanding. As students progress, it might be valuable to introduce them to more complex characters, ensuring that their growth trajectory remains consistent.

Orthographic Awareness: The significant rise in orthographic awareness by Time 3 indicates that consistent exposure and practice can help students overcome initial challenges. Since Chinese orthography is substantially different from alphabetic systems, it's likely that students took time to adapt to its unique characteristics. The introduction of spatial-positional relationships and the emphasis on copying characters likely contributed to this improvement. Further studies could explore integrating more hands-on activities, like character tracing or puzzle-solving exercises that reinforce orthographic patterns.

Phonological Awareness: The steady improvement in phonological awareness implies that students are becoming more adept at recognizing and manipulating the sound structures within Chinese. Given the tonal nature of the language, this growth is crucial. The use of tonal exercises, rhymes, or songs could be incorporated more to further enhance this awareness.

Morphological Awareness: The plateau in morphological awareness suggests that while students are gaining skills in other areas, morphological understanding remains a challenge. This stagnation could be because Chinese morphology is deeply intertwined with its orthography and phonology. To address this, future interventions could integrate more explicit instruction on word formation, compounding, and the use of radicals that denote meaning.

Listening Comprehension: The marked improvement by Time 3 in listening comprehension is indicative of the intervention's success in bolstering oral language skills. As listening skills

are foundational to reading and writing, this growth likely had a positive ripple effect on other literacy skills. Introducing a diverse range of listening materials, from stories to dialogues, could further enrich this skill.

Linguistic Factors Influencing Chinese Literacy Development

To discern the linguistic capabilities that play a pivotal role in students' Chinese literacy growth, we employed multiple regression analyses, assessing how listening comprehension and three metalinguistic skills influenced Chinese character reading at different time intervals. Table 3 reveals that our model accounted for a significant variance in character reading, capturing 34% at Time 1, 31% at Time 2, and an impressive 62% by Time 3. Diving into the metalinguistic skills, both orthographic and phonological awareness emerged as crucial drivers for character reading, with their influence being fairly consistent in the first two time points. However, by Time 3, the prominence of orthographic skills began to eclipse that of phonological awareness, resonating with findings from earlier studies on more advanced CSL learners (Wong, 2017).

On the other hand, morphological awareness presented a unique trend. Its influence remained muted and lacked statistical significance during Times 1 and 2. By Time 3, it only showed a slight uptick in significance, as indicated by a Beta-value of 0.12. This subdued impact might stem from the students' nascent Chinese vocabulary. Prior research posits that a certain vocabulary threshold is necessary for learners to leverage their morphological skills in Chinese literacy effectively. Lastly, the study underscored the importance of oral proficiency. Listening skills, a proxy for this competence, consistently showcased a significant correlation with character reading across all time points, highlighting its central role in literacy development.

Table 3

Regression models explaining character reading at Times 1, 2 and 3

Variable	R^2	β	*t*	*p*
Time 1	.34			<.01
Orthographic awareness		.27	3.24	<.01
Phonological awareness		.24	2.94	<.01
Morphological awareness		-.14	-1.76	.08
Listening comprehension		.31	3.76	<.01
Time 2	.31			<.01
Orthographic awareness		.23	2.76	<.01
Phonological awareness		.26	3.26	<.01
Morphological awareness		-.02	-.25	.81
Listening comprehension		.35	4.14	<.01
Time 3	.62			<.01
Orthographic awareness		.37	5.22	<.01
Phonological awareness		.17	2.79	<.01
Morphological awareness		.12	2.06	<.05
Listening comprehension		.45	6.46	<.01

The results provide a granular view of the linguistic competencies that bolster Chinese literacy development. The increasing influence of orthographic skills by Time 3 underscores its paramount importance in Chinese literacy. As students advance in their learning journey, the ability to discern and understand the structural properties of Chinese characters becomes

more critical. The consistent significance of phonological awareness across the three time points reinforces its foundational role in Chinese literacy. It serves as a reminder that sound-symbol associations are vital for character recognition and reading fluency. While both orthographic and phonological skills were instrumental in character reading, by Time 3, orthographic skills began overshadowing phonological awareness. This shift aligns with Wong (2017), suggesting that as students become more advanced, their reliance on visual and spatial recognition (orthography) might surpass sound recognition (phonology).

The marginal significance of morphological awareness by Time 3 suggests a potential area of focus. As students' vocabulary expands, the role of morphological awareness in literacy development may become more pronounced. Hence, continuous monitoring and tailored interventions could be beneficial. Drawing from previous research, it seems students might need a more robust vocabulary foundation to harness their morphological skills effectively. On the other hand, the significant influence of listening skills across all time points underscores the symbiotic relationship between oral language and literacy skills. A strong foundation in oral language can pave the way for successful literacy acquisition.

Conclusions and Recommendations

The comprehensive examination of the "Chinese Literacy Delight" intervention has provided a plethora of insights into the evolving landscape of Chinese literacy acquisition among Grade 1 Non-Chinese Speaking (NCS) students. The longitudinal quasi-experimental design, spread across three crucial time points, has presented findings that are both enlightening and indicative of future directions.

1. Efficacy of the Intervention:

The intervention's success is unmistakably evident from the data. A substantial number of students showcased significant improvements in pivotal areas of Chinese literacy.

The character reading trajectory, for instance, paints a promising picture. This continuous and consistent growth in such a fundamental aspect of literacy suggests that the instructional materials and methodologies employed resonated well with the students' learning needs. One key aspect of our approach is to strike a balance between spoken language and literacy skills. We put a lot of emphasis on building a strong foundation in oral language, like speaking and listening, while also focusing on developing crucial linguistic skills. These skills include understanding how Chinese characters are written, how they sound when spoken, and how words are put together. What is especially important is that this approach has proven to be effective, especially during the early stages of primary school. This is a critical time for children to start learning how to read and write in Chinese. By giving them a solid foundation in spoken language and teaching them the ins and outs of the Chinese writing system, our students have been able to make steady progress in their Chinese literacy. In simpler terms, our approach has been successful in helping students become better readers and writers of Chinese, especially when they're just starting primary school.

2. Orthographic Awareness and its Growing Prominence:

When it comes to the metalinguistic skills that are at the heart of our intervention program, the results reveal an interesting trend. In the early stages, we observed a balance between phonological and orthographic awareness. However, as we reached Time 3, a noticeable shift towards emphasizing orthographic skills became evident. This transition highlights how Chinese as a Second Language (CSL) acquisition is an evolving process with implications for instructional development. As students progress, becoming more skilled in recognizing phonological patterns, they appear to naturally shift their focus towards visual cues and spatial patterns. These aspects become particularly crucial for reading more complex Chinese characters and texts. Recognizing this developmental shift, instructional strategies can be tailored to harness this trend, making it easier for students to learn and excel in their

Chinese language acquisition. This adjustment in teaching methods can align with the changing needs and strengths of the students as they advance in their language proficiency journey.

3. The Challenge of Morphological Awareness:

While our intervention has achieved notable success in various areas, it is important to address the challenge posed by morphological awareness, which has shown limited growth. This plateau calls for a closer examination and thoughtful adjustments to our approach. It is plausible that there's a foundational prerequisite that must be met before morphological skills can flourish and become beneficial for literacy development. The intrinsic link between vocabulary acquisition and morphological awareness underscores the need to prioritize the comprehensive development of CSL learners' oral and written vocabularies. To tackle this challenge effectively, we propose a gradual and systematic introduction of morphological analysis as a tool to aid students in their ongoing development.

4. The Unwavering Significance of Oral Language:

Throughout all the time intervals examined, one skill remained consistently influential - listening. Oral language serves as an essential cornerstone for literacy acquisition and development, regardless of whether students are learning their first language (L1) or a second language (L2). Its unwavering significance underscores the inseparable relationship between oral and written language. Our study demonstrates that the impact of listening comprehension, which is an indicator of students' Chinese oral language proficiency, remains consistently significant. There exists a common misconception that oral language holds lesser importance in literacy learning for languages like Chinese, which have a complex sound-script relationship compared to alphabetic languages. However, a substantial body of research across various languages, including our own findings, strongly refutes this notion. Before

students can attain proficiency in reading and writing, they must first develop strong listening and speaking skills.

This interconnectedness between oral and written language is profound. Listening comprehension not only enhances a student's ability to understand and process spoken language but also plays a pivotal role in improving their reading and writing capabilities. It forms the foundation upon which more advanced literacy skills are built. To emphasize the significance of oral language in literacy development, educators should integrate oral language activities into their curriculum. These activities can encompass listening comprehension exercises, speaking practice, and interactive discussions. By nurturing students' oral language skills, we empower them to become more proficient readers and writers, transcending the initial complexities posed by the Chinese sound-script relationship.

Recommendations

1. Promoting Integrated Language Learning:

Given the demonstrated efficacy of our intervention in enhancing Chinese literacy and the observed shift towards emphasizing orthographic skills, we recommend that educators and curriculum developers consider adopting a more integrated approach to language instruction. This approach should continue to strike a balance between spoken language and literacy skills, but with an enhanced focus on seamlessly incorporating orthographic awareness into the overall language learning experience. By intentionally weaving orthographic elements into everyday language activities and lessons, educators can capitalize on students' natural developmental shift towards visual cues and spatial patterns. For instance, incorporating character recognition exercises during spoken language practice or integrating character writing into storytelling sessions can foster a more holistic language learning environment.

Additionally, curriculum developers should collaborate with educators to design materials and resources that promote this integrated approach. These materials should not only enhance phonological and orthographic skills but also provide opportunities for students to apply these skills in meaningful contexts, such as reading texts that blend spoken language with character recognition. In summary, our recommendation is to evolve our instructional approach to align with the changing needs and strengths of our students. By integrating orthographic awareness into our language instruction in a seamless and engaging manner, we can further enhance the effectiveness of our intervention program and support students in their Chinese language acquisition journey.

2. Enhancing Orthographic Awareness in Chinese Language Learning.

To effectively address the evolving significance of orthographic awareness in the Chinese language acquisition journey, we propose a set of targeted recommendations: (i) Sequential Curriculum Integration: Develop a curriculum that thoughtfully integrates orthographic awareness as students progress. Begin with a balanced approach, incorporating both phonological and orthographic skills. Gradually increase the emphasis on orthography over time, aligning it with students' developmental stages. (ii) Progressive Orthographic Exercises: Embed progressively challenging orthographic exercises into the curriculum. Start with core simple character recognition and systematically introduce more complex characters and spatial patterns. These activities should encourage students to analyse the structure of Chinese characters and comprehend how various components contribute to their meanings. (iii) Visual Learning Resources: Leverage visual learning resources, such as multimedia presentations, flashcards, and character animations, to enhance students' visual recognition of Chinese characters. Utilize technology to create interactive exercises and games that engage students in practicing orthographic skills. (iv) Integration with Reading Material: Align reading materials with the progression of orthographic awareness. Introduce texts that

correspond to students' increasing ability to recognize Chinese characters and spatial patterns. Encourage students to apply their developing orthographic skills in real-world reading scenarios.

3. Enhanced Vocabulary Acquisition and Morphological Awareness.

In light of our intervention's overall success, we must also address the notable challenge presented by morphological awareness, an area that has exhibited limited growth. This plateau calls for a comprehensive approach to ensure that morphological skills can be effectively developed and harnessed for literacy learning. One potential reason for this challenge may lie in the foundational requirement of robust vocabulary development. Morphological awareness and vocabulary acquisition are intrinsically linked. Therefore, it is imperative that we prioritize the cultivation of CSL learners' oral and written vocabularies as a fundamental step.

To tackle this challenge, we recommend a gradual and systematic introduction of morphological analysis as a facilitative tool for students' ongoing development. This approach can be integrated into our teaching methodologies, fostering a deeper understanding of the morphological structures inherent in the Chinese language. This integration should involve both oral and written components of language learning. As students progress, they can begin with simpler word forms, gradually moving to more complex ones, allowing them to grasp morphological structures at a manageable pace. Furthermore, morphological exercises should be incorporated into our curriculum, encouraging students to deconstruct words into their constituent morphemes. Through these activities, students can explore how affixes, roots, and word structures contribute to word meanings within meaningful contexts such as reading and writing exercises. Providing constructive feedback during these exercises is crucial, guiding students in their application of morphological analysis. Additionally,

personalized support and resources should be readily available for those students who may require extra assistance in developing morphological awareness.

4. Strengthening Oral Language Activities:

To bolster the significance of oral language in literacy learning, we propose a series of targeted recommendations: (i) Integrate Oral Language Activities: It is crucial to weave regular oral language activities into the curriculum. These activities should encompass group discussions, storytelling sessions, and opportunities for oral presentations. The aim is to create an environment that encourages active listening and meaningful oral interactions among students. By engaging students in spoken discourse, we lay the groundwork for strong oral language skills. (ii) Enhance Listening Comprehension Skills: Listening comprehension exercises play a pivotal role in strengthening oral language. These exercises should utilize diverse forms of media, including audio recordings, podcasts, and videos in Chinese. Authentic Chinese content such as news broadcasts, interviews, and podcasts can be introduced to challenge students and improve their listening skills. (iii) Vocabulary Enrichment through Conversation: Vocabulary development should be intertwined with oral language activities. Structured conversations that promote vocabulary enrichment can be designed. Encourage students to actively use newly acquired words in their spoken interactions. Additionally, create opportunities for students to discuss and debate topics relevant to their curriculum, thereby deepening their understanding of subject matter. (iv) Cultural Immersion Experiences: Organize cultural immersion experiences, such as Chinese language clubs or cultural activities, to immerse students in real-life Chinese language contexts. Participation in Chinese cultural events and activities further enhances language acquisition by providing practical exposure to the language in various social settings.

5. General Curriculum and Pedagogical Recommendations

In the context of CSL literacy learning for young learners at grade 1, the focus shifts to the specific needs and challenges that arise during this critical phase. Based on our experience of implementing a two-year intervention program, we offer the following recommendations tailored to CSL curriculum development and pedagogy: (i) Tailored Assessment Strategy for Young Learners: Recognizing the unique needs of grade 1 CSL learners, it is essential to design a comprehensive evaluation strategy. Periodic assessments should be thoughtfully integrated into the curriculum to provide snapshots of students' evolving competencies. These assessments should not only gauge their progress but also identify areas requiring attention. A well-structured assessment framework will serve as a roadmap for future instructional strategies, ensuring that they align with the specific developmental stages of young learners. (ii) Inclusive and Individualized Feedback: To enhance CSL literacy acquisition in grade 1, it is imperative to establish a feedback-driven iterative approach that involves educators, researchers, students, and even parents. This multi-stakeholder feedback loop serves as a vital source of information, shedding light on ground realities, challenges, and potential solutions. Through this collaborative feedback mechanism, educators can gain valuable insights into the diverse needs of grade 1 learners and adjust teaching methods accordingly. (iii) Age-Appropriate Learning Materials: Grade 1 CSL learners benefit immensely from age-appropriate learning materials that engage their curiosity and imagination. Develop teaching resources, such as storybooks, games, and interactive multimedia, designed specifically for young learners. These materials should not only align with the curriculum but also be culturally relevant and captivating, making the learning experience enjoyable and meaningful. (iv) Language-Rich Environment: Create a language-rich environment in the classroom and beyond. Encourage frequent oral interactions through storytelling, group discussions, and language games. Establish a supportive

atmosphere where young learners feel comfortable expressing themselves in Chinese, fostering confidence in using the language.

Concluding Remarks

The journey of Chinese literacy development among Non-Chinese Speaking (NCS) students is undeniably intricate and multifaceted. It presents both challenges that must be acknowledged and harnessed, as well as the unexplored potential of a diverse group of learners. The "Chinese Literacy Delight" intervention stands as a beacon of hope, illuminating this path and offering clear direction for educators and researchers alike. As we reflect on our research project, we find ourselves at a pivotal juncture in the quest for effective strategies to empower NCS students with Chinese literacy skills. Our experience underscores the crucial importance of adaptability, innovation, and a student-centric approach. The onus is on us, as educators and researchers, to continue pushing the boundaries of what is achievable in the realm of Chinese literacy for NCS students.

With sustained efforts, research-backed interventions, and a relentless pursuit of excellence, we can envision a future where every NCS student in Hong Kong is not only proficient but truly confident in their Chinese literacy. This vision extends beyond the classroom, encompassing their broader academic endeavours and their socio-cultural integration within the Hong Kong community. It is imperative that we harness the insights gained from our intervention to inform and shape future initiatives. The "Chinese Literacy Delight" intervention has laid a foundation upon which we can build, refine, and innovate. It has shown us that with tailored strategies, individualized support, and an unshakable belief in the potential of each NCS student, we can transform their educational journey into one marked by achievement and empowerment.

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