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An Evaluation of Authenticity: A Content Analysis of K-6 *Mandarin Matrix* Textbooks for Chinese Dual Language Immersion Programs

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AN EVALUATION OF AUTHENTICITY: A CONTENT ANALYSIS OF K-6 *MANDARIN MATRIX* TEXTBOOKS FOR CHINESE DUAL LANGUAGE IMMERSION PROGRAMS

by

Hsiaomei Tsai

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ABSTRACT

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by

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Utah State University, 2024

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Authentic texts are recommended for developing pragmatic language skills to facilitate communicative interactions with native speakers. Through content analysis and a teacher survey, this study explored linguistic and cultural authenticity evident in the Utah Chinese Dual Language Immersion (DLI) literacy curriculum, focusing on the Grades K-6 *Mandarin Matrix* textbooks. The results revealed high linguistic authenticity (above 96%) in word usage, word order, and situational representation, with a developmental progression from 96.33% to 99.73%. Cultural authenticity was also high (exceeding 95%) in illustrated scenarios and character behaviors across Grades K-6 books. However, settings portrayed in illustrations throughout Grades K-5 books indicated a lower level of authenticity (43% to 54%) in representing Chinese culture; the content instead often reflects Western or American culture. Notably, the recently revised Grade 6 textbooks exhibited more authentic settings, likely because of their incorporation

of China-related contexts across all units. Overall, there was a trend of increasing cultural authenticity across Grades K-6, ranging from 82% to 98%.

The teacher survey highlighted Utah Chinese DLI teachers' perceptions regarding the frequency of usage, advantages, limitations, and implementation of classroom activities when teaching with the *Mandarin Matrix* textbooks. Findings indicated strong agreement that the *Mandarin Matrix* program supports Chinese reading with spiraled vocabulary promoting students' learning of Chinese characters. However, there was disagreement on whether the *Mandarin Matrix* materials support students' reading authentic materials outside class and students' intercultural understanding. Participating teachers communicated that the *Mandarin Matrix* books could be improved to incorporate more authentic language and Chinese culture. Although limited in scope and sampling, findings address research gaps regarding the representation of authentic Chinese language and culture in the elementary curriculum. Moreover, this assessment of linguistic and cultural authenticity provides insights for developers of Utah's Chinese literacy curriculum and suggestions for designing more authentic content to foster students' intercultural communicative competence (ICC) within Utah's Chinese DLI programs.

(212 pages)

PUBLIC ABSTRACT

An Evaluation of Authenticity: A Content Analysis of K-6 Mandarin Matrix Textbooks for Chinese Dual Language Immersion Programs

Hsiaomei Tsai

Authentic texts are suggested for building practical language skills that go beyond the classroom, helping language learners to communicate with native speakers. This study used content analysis and a teacher survey to examine how the Utah Chinese Dual Language Immersion (DLI) literacy curriculum, featuring the Grades K-6 *Mandarin Matrix* textbooks, reflects realistic Chinese language and culture. Additionally, this study explored the pedagogical value of these textbooks in Utah's Chinese DLI programs via a teacher survey. The results showed high linguistic authenticity in word usage, order, and situations, consistently above 99% across Grades K to 6 books. Cultural authenticity, particularly in scenarios and characters' behaviors, exceeded 95%. However, settings (e.g., housing styles, living environments, and decorations) portrayed in Grades K-5 books exhibited lower authenticity (ranging from 43% to 54%), with notable enhancement in Grade 6 textbooks (98%) because Grade 6 books include China-related contexts across all units. Overall, the cultural authenticity increased from Grades K (82%) to 6 books (98%).

Feedback from the teacher survey highlighted the importance of the *Mandarin Matrix* program in facilitating Chinese reading and vocabulary acquisition among students. Teachers emphasized the need to increase cultural authenticity to promote

students' intercultural understanding. Although this research involved a limited number of participants with a narrow scope, it helps fill gaps in understanding how authentic Chinese language and culture are represented in elementary school materials. Evaluating the language and culture in the texts and pictures affords useful ideas for editors of Utah's Chinese literacy curriculum. The overall results serve as valuable information for statewide professional development (PD). PD trainers can consider related insights to support Utah Chinese DLI teachers' work to enrich students' authentic language exposure and deepen their experiences with Chinese culture in the classroom.

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I am appreciative of my family friends, Eva and Wei, who have generously allowed me to live with them for the past 8 years. Their care and love throughout my doctoral life have been great blessings, providing me with the strength to endure the challenges and keep moving forward. I will always treasure their invaluable influence on me.

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CHAPTER 1

INTRODUCTION

The authenticity of texts for language teaching was first acknowledged by Henry Sweet in 1899 (Skiada, 2021). Sweet was an English philologist specializing in Germanic languages and his 1900 book *The Practical Study of Language* referred to authentic texts as natural texts. He claimed that natural texts provide a greater advantage over less natural or controlled texts because "they do justice to every feature of the language" (p. 178). According to Sweet (1900), controlled texts emphasize the repetition of selected grammatical elements and language functions. Based on this feature, some scholars have categorized them as pedagogical texts (Qi, 2021; Rahman, 2014) or adapted texts aligned with instructional purposes (Berardo, 2006; Nghia, 2019). Adapted texts can make content more accessible to beginning language learners (Campos, 1991; Libert, 2013, 2016). Repetition that reinforces foundational language skills may accommodate learners' lower language levels and needs for basic linguistic input (Zyzik & Polio, 2017). However, repetition of selected and sequenced grammar, syntax, or vocabulary can fail to represent real-life communication (Berardo, 2006; Gilmore, 2007). Authentic content provides examples for communicative functions in social situations (Widdowson, 1978) because the purpose is to demonstrate genuine communication and language usage in actual contexts (Mishan, 2005). As highlighted by Berardo, readers of more authentic texts can obtain information that enables them to respond more appropriately to the real-world environment (e.g., street signs, restaurant menus) and situations (e.g., getting directions, ordering food).

Consideration of authentic texts for use in language classrooms aligns with communication-based instruction. In the 1970s, the communicative language teaching approach featured the integration of authentic texts into the second language (L2) teaching and learning field (Gilmore, 2007). Authentic discourse in L2 teaching and learning is viewed as essential for students to develop pragmatic language skills and equip them with communicative competence for outside the classroom (van Lier, 2013). An underlying feature of authentic texts is the range of cultural aspects represented by the language and textual content. An individual can utilize a language more successfully to communicate if they possess the cultural knowledge associated with a language function, whereas cultural misunderstanding and awkwardness can hinder communication (Cremona, 2016; Nostrand, 1989). In research on using authentic texts in L2 teaching, scholars have provided evidence of multiple benefits for L2 learners including expanding learners' vocabulary (Schmitt & Schmitt, 2014; Shakibaei et al., 2019), introducing a variety of language functions (Crossley et al., 2007; P. Huang, 2019), stimulating learners' cognitive processes (Mart, 2018; Pavlova & Vtorushina, 2018; Shadiev et al., 2017), and enhancing learners' motivation (S. Huang, 2018; Ziyoda, 2023). Such outcomes can contribute to more competent and enthusiastic language use in real-world contexts. Building on these benefits, the use of authentic texts can play a crucial role in developing L2 learners' readiness to function successfully with native-language speakers (Gilmore, 2007; Guariento & Morley, 2001; Reid, 2014), a concept known as intercultural communicative competence (ICC; Byram, 1997, 2021).

Developing Intercultural Communicative Competence

A theory of communicative competence was developed by Hymes (1972) and Swain (1985) focusing on language learners' abilities to use languages in factual scenarios or genuine circumstances and emphasizing linguistic competence. Byram (1997, 2021) proposed ICC as an extension of the theory of communicative competence (CC). ICC refers to an individual's capacity to effectively and appropriately communicate and interact with people of different cultural backgrounds. It entails proficiency to interpret and demonstrate respect for cultural norms, values, and perspectives and aptitude to handle intercultural conflicts (Byram et al., 2002). ICC seeks to transcend linguistic competence and cultivate cultural sensitivity that equips users to bridge cultural disparities. With such competence, an individual can make meaningful connections across cultural boundaries. Therefore, ICC assumes a critical role in fostering efficient communication practices and constructive relationships within multicultural contexts (Byram, 2021).

Authentic Texts in Support of Intercultural Communicative Competence

By design, authentic texts promote natural communication models that pedagogical texts may lack. Situational contexts embedded in authentic texts likely afford more connection to learners' life experiences than pedagogical texts (Breen, 1985; Zohoorian, 2015). Authentic texts typically include contexts and language functions that can help language learners achieve ICC (Byram, 2021). For example, a language learner is reading a blog post written by a native-Chinese speaker (一路南风, Trans., All the

Way Southwind, 2024). “在桂林，桂花既是观赏植物，还可以提炼成香料、化妆品，制作成美食、美酒等。在桂林的街头和各大美食天地都有售卖桂花糕的地方” (Trans., In Guilin, osmanthus flowers are not only ornamental plants but can also be refined into spices, cosmetics, and made into delicious foods and wines. On the streets of Guilin and in various food markets, you can find places selling osmanthus cakes). These sentences include brief descriptions and explanations revealing unique cultural practices in Guilin. They introduce learners to the significance of osmanthus flowers in Guilin culture and provide a clear context of how these flowers are integrated into Guilin’s various economic activities. By conveying information and developing learners’ cultural understanding, such texts enrich the language learning experience.

Acquiring ICC indicates that individuals are culturally and linguistically competent in the target language (TL). They have presumably developed a set of knowledge of and skills with the TL, positive attitudes toward cross-cultural contacts, and appropriate behaviors for communicating with people representing the respective cultures (Leung et al., 2014; Reid, 2014; Wilberschied, 2015). Authentic texts can provide learners the opportunity to learn similarities and differences between their culture and the TL culture. Cultural comparisons can help learners build an understanding of the TL culture and the commensurate language functions (Moeller & Nugent, 2014). With extensive exposure to authentic texts, L2 learners can be better prepared to communicate in the TL appropriately and effectively in real circumstances such as negotiation of prices, requests for help or information, describing feelings, and so forth (Rahman, 2014; Swaffar, 1985).

Another example, the sentence “不可以随便跑来跑去” (Trans., Can’t just run around) is from a Chinese storybook about shopping in the grocery store (工藤纪子, Trans., Noriko Kudoh, 2006). When learners read this sentence, they may only recognize and understand what 不 (not) and 跑 (run) mean. However, they may associate their prior world knowledge of these two words with their own shopping experiences. Learners retrieve the meaning of these two words and connect them to the associated picture to infer the literal meaning of the whole sentence. This is a process of accessing information from memory, using knowledge and reasoning to determine that “不可以随便跑来跑去” is saying *do not run in the grocery store*. In this instance, the cognitive process of inferring not only supports learners’ comprehension of a whole sentence but also to learn socially appropriate behaviors in general.

According to sociocultural perspectives, instruction should promote participatory involvement “in authentic goal-oriented practice” (Stone & Learned, 2014, p. 10). Content that privileges authentic language should foster learners’ interaction with native speakers and positive interest in learning the TL. In the case of learners living in an environment or location where the TL is not the primary language, authentic resources are essential for them to increase language proficiency (Andon & Wingate, 2013; P. Huang, 2019). The social contexts, linguistic variety (semantics, syntax, grammar), and the TL culture represented in authentic texts can prepare students to develop strategies for dealing with real-world discourse in communication that they could encounter beyond the classroom (Ciornei & Dina, 2015). Importantly, consistent exposure to authentic texts as a learning approach can gradually enhance learners’ linguistic, communicative, and

cultural competences (van Lier, 2013).

Authentic Texts for Different Levels of Learners

Learning to read takes time, considerable exposure, and effective instruction or support. This is especially true when learning to read in a new language. Authentic texts for L2 learners are controversial due to their potential difficulty for lower-level learners (Ciornei & Dina, 2014; Rahman, 2014). Developmentally progressive leveling of authenticity is therefore a relevant issue (Long & Ross, 1993; Rets & Rogaten, 2021). Generally, passages in textbooks for L2 learners integrate both authentic and less authentic language to support the early stages of language and literacy development (Simonsen, 2019). Accordingly, textbook writers may simplify some vocabulary and structures to meet lower-level L2 learners' needs. Although some researchers and practitioners in the field of L2 acquisition advocate for not adapting authentic texts, especially for higher-level L2 learners (Krashen, 1982; Larsen-Freeman & Anderson, 2013), texts are generally designed to progressively include more complex language and structures. In this sense, planned incrementality of authenticity could be valuable for L2 learning. Nonetheless, how the progression works to strengthen learners' ICC is both a design and research concern (e.g., Andarab & Rahimi, 2013; Tatsuki, 2006) including how the authenticity of texts contributes to learners' development of ICC and how it is sequenced and studied, especially in classroom settings.

Varying levels of authenticity within texts were proposed by Brown and Menasche in 2005 (as cited in Tatsuki, 2006), including five levels of authenticity: genuine, altered, adapted, simulated, and inauthentic texts. The genuine level of

authenticity refers to texts intended for native speakers, not for classroom language instruction. On the other hand, the inauthentic level pertains to texts created only for the classroom and having few authentic characteristics. The altered, adapted, and simulated levels of authenticity are modified texts for teaching purposes. These three levels of texts represent a continuum of linguistic forms that include shorter or simplified sentences with less difficult vocabulary and language structures.

Simplifying vocabulary and language structure can decrease the complexity of sentences, making texts more accessible for less advanced language learners (Simensen, 1987). Nevertheless, modification "should be well-executed" (Guariento & Morley, 2001, p. 348) to contribute to communicative competence in the TL. In essence, despite degrees of modification, authentic texts are supposed to support language learners' realistic communicative tasks when using the TL with more competent users.

Goals of Dual Language Immersion Programs

Bilingualism and programs to support its development have attracted attention among U.S. parents and educators, especially in recent decades. An example of such efforts is Dual Language Immersion (DLI) programs that are designed to support students in developing English and TL proficiency from the elementary grades and continuing into secondary school. To meet this goal, DLI programs integrate instruction of academic content with both languages (English and the TL). Students are offered at least 50% exposure to TL instruction for content learning in math, science, and TL literacy. This programming serves to foster students' acquisition of content knowledge and language

and literacy skills simultaneously (Tedick & Lyster, 2020; U.S. Department of Education, 2015; Yuan, 2019).

Although sharing some common goals, DLI programs often vary, in part, because of where they are implemented. For example, DLI programs targeting English and Spanish are more common in areas with higher densities of Latinos. Students in such locales can benefit from hearing and seeing more Spanish in their environments (Ee, 2023; Gómez, 2006). However, in regions without a high population of native speakers of certain target languages such as Mandarin, resources for the DLI students are often limited (Christian, 2016). Additionally, students have likely been exposed to English much more than the TL before enrolling in the DLI programs (Lucero, 2016). Thus, aspects of a targeted additional language, including vocabulary and syntax may need to be simplified or modified for novice learners. Determining how content and texts are presented in the TL curriculum is a critical step in understanding how a chosen curriculum contributes to program goals. To deliver an effective curriculum for DLI students, linguistic complexity in textbooks should afford a developmental sequence that aligns with the vision and goals of cultivating intercultural and communicative competence (Weninger, 2021).

Mandarin Matrix Curriculum and Textbooks

Developing adequate proficiency and literacy in two languages simultaneously is the major goal of the Utah DLI program (Spicer-Escalante, 2017; Watzinger-Tharp & Leite, 2017). The Utah Chinese DLI initiative responded to this goal by developing a set of literacy texts—*Mandarin Matrix* with the University of Utah Confucius Institute

(*Mandarin Matrix*, 2024). It remains the only authorized curriculum for Chinese-English DLI programs in the state.

Mandarin Matrix publishes a set of textbooks designed to support students from the foundational and novice through the intermediate levels. The intermediate level is designed for students above Grade 5 (Utah Language Immersion, n.d.). The content of each textbook unit is scenario-based with dialogues and contexts that pertain to students' life experiences (e.g., school, family, friendships). The *Mandarin Matrix* company claims that the textbooks embody fun and engaging stories (*Mandarin Matrix*, 2023) along with spiraled instruction to reinforce learning of Chinese characters and grammar, to the intermediate level. Nonetheless, some consistent issues with respect to the authenticity of texts have been raised by teachers including oversimplification, inauthentic terms, or reliance on verbiage translated literally from English. These issues could contribute to an inauthentic presentation of Chinese language structures and Chinese culture (Curdt-Christiansen, 2008), but they have not been researched.

Concerns for Authenticity in the Utah Chinese Dual Language Immersion Curriculum

Over the course of nearly a decade, my teaching experience in Utah's Chinese DLI programs has allowed me to witness the development and growth of the program. Throughout this period, I have personally observed significant changes in the Chinese literacy curriculum. In the initial stage, the state introduced *Better Chinese* as the primary curriculum, which placed a strong emphasis on developing oral proficiency (S. Lyon, personal communication, February 12, 2024). During the 2014-2015 academic year, the

state incorporated *Chinese(中文)* textbooks to strengthen students' reading and writing competencies. However, the usage of these textbooks was limited to only 1 year. During the semi-annual teacher training sessions, there was a consensus voiced among teachers that the content of the *Chinese (中文)* textbooks proved to be excessively challenging for students. This raised teachers' concerns that learning Chinese was more demanding than expected. The following year *Mandarin Matrix* was published and adopted, as the mandatory curriculum across Utah's Chinese DLI programs. While instructing students using the *Mandarin Matrix* curriculum, I have observed instances where certain language structures appeared to be unnatural and noticed the challenges that many DLI students encountered in achieving a high level of language proficiency.

Utah school districts that implement Chinese DLI programs have served more English-dominant students than Chinese-dominant students (Sung & Tsai, 2019). The majority of Utah's Chinese DLI students generally have limited resources for learning Chinese outside of DLI classrooms (Sung, 2022; Sung & Tsai, 2019). Thus, a language curriculum that offers learners pragmatic use of Chinese and knowledge of Chinese culture may be needed to offset the dearth of resources outside the classroom.

Research has shown that Utah Chinese DLI students' language proficiency is lower than that of other DLI target languages (Watzinger-Tharp et al., 2021). These outcomes may be attributed to various factors, including the complexity of Chinese; limited resources available outside the classroom (H. Zhang et al., 2020), learners' L2 (Chinese) experiences (Ke & Chan, 2017), instructional methods (Qi, 2021), and the literacy curriculum (P. Chen, 2021; Lin, 2019). These factors and their role in effective

teaching and learning of Chinese have received scant research attention. A few studies have looked at the *Mandarin Matrix* curriculum (P. Chen, 2021; Lin, 2019), but none have evaluated the authenticity or advantages of its K-6 textbooks. How the reading program presents authenticity, what level of authenticity is included in the various grade-level books, and how this set of textbooks supports students' learning of pragmatic Chinese remain unanswered questions.

Statement of the Problem

The expansion of DLI programs in Utah includes Chinese, French, German, Portuguese, and Spanish as TLs in state public or charter schools (Utah Dual Language Immersion, 2023a). One of the challenges that the Utah Chinese DLI program has faced is achieving the same TL competency as DLI students of other languages. Comparisons of language outcomes show that Chinese DLI students fall behind those of French, Portuguese, and Spanish DLI students in the ACTFL Assessment of Performance toward Proficiency in Languages (AAPPL) test (Watzinger-Tharp et al., 2021).

The content of AAPPL was developed to assess students' abilities to carry out linguistic tasks regarding personally, socially, and academically relevant topics of communication. This assessment includes interpersonal listening/speaking, presentational writing, interpretive reading, and interpretive listening (Language Testing International, 2022). The comparison of mean scores on AAPPL tests from 2013 through 2018 with two different cohorts can be found in Table 1.1 (the writing scores were not reported).

Table 1.1

Grades 3-5 Chinese, French, Portuguese, and Spanish Dual Language Immersion Students' AAPPL Mean Scores

Grade	Target language	Language skills	AAPPL mean score	ACTFL proficiency
3	Chinese	Speaking	3.60	Novice Mid
3	French	Speaking	4.50	Novice High
3	Portuguese	Speaking	4.90	Novice High
3	Spanish	Speaking	4.70	Novice High
4	Chinese	Listening	3.80	Novice Mid
4	French	Listening	5.10	Intermediate Low
4	Spanish	Listening	5.60	Intermediate Low
4	Chinese	Reading	2.70	Novice Low
4	French	Reading	5.20	Intermediate Low
4	Spanish	Reading	4.90	Novice High
5	Chinese	Speaking	4.70	Novice High
5	French	Speaking	6.50	Intermediate Mid
5	Portuguese	Speaking	6.40	Intermediate Mid
5	Spanish	Speaking	5.80	Intermediate Low

Note. The mean scores were adapted from "Sustaining dual language immersion: L2 outcomes in a state-wide program" by Watzinger-Tharp, J., Tharp, D. S. & Rubio, F, 2021, *The Modern Language Journal, 105*(1), 194-217.

The lower achievement in speaking, listening, and reading Chinese may be attributed to the aforementioned factors. However, the disparities between the Chinese orthographic system and the English alphabetic written system likely require teachers to intentionally attend to similarities and differences (Koda, 2005; Y. Wang & Wang, 2022). Along with the teacher's instructional approach, Chinese learning materials such as textbooks, visual resources, or videos are important, too. To facilitate students' reading comprehension in Chinese, the textbook plays an essential role. According to Weninger (2021), textbooks are considered the main "pedagogic aids in the classroom-based acquisition of a second or foreign language" (p. 134). Thus, understanding how textbooks used in Utah's Chinese DLI program support students' language competence merits

systematic evaluation.

Significance of the Problem

Chinese DLI teachers in Utah are required to use the Chinese literacy curriculum: *Mandarin Matrix*. However, whether this set of textbooks sufficiently represents authentic use of Chinese language has not yet been formally evaluated. Some previous studies (Berardo, 2006; Bhandari & Bhusal, 2020; S. Huang, 2018; Zyzik & Polio, 2017) have investigated the benefits of using authentic materials in L2 teaching and learning. Based on communicative and sociocultural perspectives, existing studies exploring how textbooks entail situational authenticity (real-world contexts), interactional authenticity (using TL appropriately), and cultural authenticity have focused mostly on learning English as a foreign/second language. There are relatively few research studies targeting Chinese language learners in general (S. Huang, 2018; Xian et al., 2012). Additionally, existing research that analyzed authentic materials for Chinese language learners has focused on adult learners, especially college-level students (e.g., P. Huang, 2019; S. Huang, 2018; Qi, 2021). The concern is that without sufficient exposure to authentic language use via textbooks and instruction at young ages, learners' overall language proficiency could be diminished.

In addition to conducting an in-depth and methodical investigation of the curriculum, it is important to gain insights into the perceptions of Utah Chinese teachers regarding the usefulness of the *Mandarin Matrix* textbooks for their instructional purposes. Understanding teachers' perceptions of using the *Mandarin Matrix* textbooks could reflect related pedagogical concerns. Additionally, obtaining teachers' insights

about usage could elucidate the value of this set of textbooks for transmitting functional and appropriate language to students of different ages. Teachers' thoughts could inform how the *Mandarin Matrix* textbooks could be edited in the future for the promotion of students' linguistic and cultural competence.

Purpose of the Study

The goal of the Utah DLI programs is that students achieve high proficiency and cultivate communicative competence in the TL (Utah Dual Language Immersion, 2023b). However, while the growth of Chinese DLI programs in Utah continues (Asia Society, 2024), there is a lack of evaluation of how texts in the *Mandarin Matrix* series reflect and support these program goals. Thus, the present study examined the *Mandarin Matrix* texts from Kindergarten through Grade 6 concerning authenticity guided by the following research questions.

1. How linguistically authentic (to native Chinese) is the linguistic content of the *Mandarin Matrix* K-6 textbooks?
    a. How authentic (to native Chinese) is the word-level content of the *Mandarin Matrix* K-6 textbooks?
    b. How authentic (to native Chinese) is the sentence-level content of the *Mandarin Matrix* K-6 textbooks?
2. How culturally authentic (to native Chinese cultures) are the *Mandarin Matrix* K-6 textbooks?
    a. How culturally authentic are the communicative messages of the characters in the *Mandarin Matrix* K-6 textbooks?
    b. How culturally authentic are settings presented in the *Mandarin Matrix* K-6 textbooks?

   c. How culturally authentic are the behaviors of the characters used in the *Mandarin Matrix* K-6 textbooks?

3. Do the *Mandarin Matrix* textbooks increase in linguistic and cultural authenticity across the K-6 grade levels?

4. What are the perceptions of K-6 Utah Chinese DLI teachers using the *Mandarin Matrix* textbooks for Chinese teaching and learning?

Delimitations

As is typical of singular research studies, the content analysis and teacher survey items employed in this study were constrained by various factors. The content analysis manifested how the texts represent authenticity. However, as the researcher, my subjective perspective on the evaluation of authenticity could influence such estimations (Elo & Kyngäs, 2007). Although intercoder reliability (Cheung & Tai, 2021) for the content analysis was established, some level of subjectivity within coders may have existed. Moreover, the content analysis focused on K-6 textbooks, excluding those for Grades 7 and 8. Thus, the findings may not reflect a comprehensive understanding of how the extended *Mandarin Matrix* textbooks support students' language development.

Language textbooks are pedagogical resources for learning a language and its related culture (Weninger, 2021). However, some cultural elements remain the same over time, while others are ever changing within societies (Spencer-Oatey, 2012). Thus, the cultural aspects of content in the *Mandarin Matrix* books and the results for cultural authenticity in the present study may only represent culture within current Chinese societies.

Interpreting teachers' responses via a basic survey can be challenging. The

structure of the survey questions may have constrained respondents from providing useful insights (Simon & Goes, 2013). It is possible that some teachers may not have provided their true thoughts, which could have influenced the findings. Moreover, the pool of K-6 Chinese teachers survey is relatively small because of the size of the program, and teachers who are recently retired, resigned, or switched to secondary schools may have chosen not to participate in the survey.

This present study does reveal possible associations between the results of content analysis and teachers' perceptions. It does not establish any causation between textbook authenticity and students' language proficiency. Additionally, the survey is limited to teachers, so the opinions of students about learning Chinese via the *Mandarin Matrix* books remain unknown. Finally, the singular context of Utah Chinese DLI programs in this study limits the generalizability of the findings to other language programs that use the *Mandarin Matrix* textbooks or other materials. The teaching model of Utah DLI may be different from language programs in other states. The time allowance for Chinese literacy instruction, literacy curriculum, and additional resources in DLI programs of other states all potentially influence how teachers utilize the *Mandarin Matrix* textbooks in the classroom.

Recognized Limitations

The content in the *Mandarin Matrix* textbooks is written in simplified Chinese characters that are mainly used in mainland China, Malaysia, and Singapore. However, other Chinese-speaking countries such as Hong Kong, Macau, and Taiwan use traditional

Chinese characters. The complexity of strokes in these systems is determined by the government of the aforementioned countries (Jiang et al., 2020; T. Liu et al., 2016; R. Yang & Wang, 2018). Thus, word usage and ways to describe things, situations, or events among Chinese natives can vary depending on simplified and traditional characters. Such differences can influence the interpretation of semantic, syntactic, and cultural authenticity by researchers from different Chinese-speaking countries (T. Liu et al., 2016; R. Yang & Wang, 2018). To reduce the impact of this possible limitation, two coders (one Taiwanese and one Hong Kongese who have taught using the *Mandarin Matrix* books) applied their experience of interacting with simplified-character publications in daily life and in teaching to interpret the data. Regarding the teacher survey, the number of responses from each grade level and different teaching experiences of teachers was unequal and thus limited general interpretations.

The generated responses only represent participating teachers' perceptions. In addition, the teacher participants' survey responses may not fully reflect their opinions. More information about insights and attitudes toward the *Mandarin Matrix* books or how they teach the content would require further research that includes interviews or classroom observation. The thoughts of teachers who do not respond to the survey are unknown, which also attenuates the results (Johnson & Christensen, 2017).

Conclusion of the Introduction

Authentic texts help students understand that language is not divorced from daily life. Students' awareness of pragmatic language can be raised via instruction and

exposure, and this facilitates communication in real social interactions. Although authentic texts can be difficult to comprehend for language learners of lower proficiencies, such resources are intended to help students build vocabulary, syntactic structures, and values representative of the respective cultural system. Hence, using authentic texts should lead to valuable learning outcomes, specifically communicative and cultural competency, and even support strong literacy competence in the target language (TL). Meeting these goals depends, in part, on the quality of the materials used. Therefore, investigating the primary instructional materials for the Chinese DLI curriculum is a worthy research endeavor.

CHAPTER 2

LITERATURE REVIEW

Like many countries, the U.S. is becoming more linguistically and culturally diverse. The Census Bureau reports that at least 350 languages are currently spoken within homes in the U.S. (U.S. Census Bureau, 2015). Park et al. (2018) indicated that the increasing linguistic diversity among youngsters under the age of 8 accounted for nearly one-third of all children living in the U.S. and entering public school. A growing population of bilingual or multilingual children led the U.S. public education system to establish language programs to support these students (Gort & Sembiante, 2015; Wiley & García, 2016). One current trend is an increase in DLI programs designed to maximize and promote linguistic diversity in the U.S. (Howard et al., 2018; Lindholm-Leary, 2001). In the past decade, research on the efficacy of DLI programs has upheld the premise that DLI instruction can help individuals develop bilingual or multilingual proficiency as part of their academic achievement (Tedick & Lyster, 2020).

Researchers have demonstrated that DLI students' English competence and academic performance in math and science can achieve at the same or a higher level than their non-DLI peers (Genesee & Lindholm-Leary, 2013; Marian et al., 2013; Steele, et al., 2017, 2019). Regarding proficiency in the targeted languages, multiple studies have shown that DLI students' reading, writing, and speaking reach an intermediate level by Grade 5 or 6 and many DLI students' four language skills approached an advanced level in Grade 9 (Watzinger-Tharp, Rubio, & Tharp, 2018; Watzinger-Tharp et al., 2021; Xu et al., 2015). For English learners (ELs), DLI programs have been effective learning settings

for closing their academic gaps with English-native students (Campbell, 2022; Collier & Thomas, 2017). These encouraging findings indicate that DLI programs are beneficial not only for English-native students but also for students learning English as a second language (L2). However, Watzinger-Tharp, Rubio, and Tharp (2018) and Watzinger-Thearp et al., 2021) reported a difference among Chinese DLI students' language proficiencies. While many Chinese DLI students' listening skills reached the intermediate level prior to Grade 6, their reading and speaking proficiencies were scored as novice high. Along with academic and linguistic achievement, dual-language learning may influence students to develop cultural understandings via exposure to cultures that use the TL (Heinrichs, 2016). Such communicative competencies ostensibly could open the door for DLI learners to careers in international business, foreign affairs, or educational experiences (Gómez & Cisneros, 2020; Lindholm-Leary, 2016).

Challenges for Language Programs

Although research has demonstrated the success of DLI programs for students, there are studies addressing concerns associated with DLI outcomes (Aguilar et al., 2020; Gómez & Cisneros, 2020; Potowski, 2007; Watzinger-Tharp, Rubio, & Tharp, 2018; Watzinger-Tharp et al., 2021). Potowski documented four Grade 5 students' percentages of time using English and Spanish in an English-Spanish (one-way immersion) dual-language classroom. Two students' first language (L1) was Spanish and two students' L1 was English. Their oral proficiency in Spanish was rated above 3 out of 5 by the Center for Applied Linguistics (CAL). Their academic achievements in both languages were

considered good on standardized tests (reading, math, science, and social studies). However, through 59 hours of observation in a focal class taught by a bilingual teacher, Spanish was used for academic purposes with the teacher, rather than for social communication. These students predominantly (86% of the time) chose to communicate in English when engaging in tasks unrelated to class lessons. Notably, Potowski found that Spanish L1 students used the most English in the dual-language classroom. Potowski suggested that the dual immersion setting failed to increase these students' Spanish use due to a couple of factors. The focal teacher encountered a dilemma in striking a balance between students' English and Spanish production. At times, she allowed students to respond in English during Spanish instruction to keep the lessons progressing. This situation may have influenced students' motivation to produce Spanish and their identity development as bilingual speakers. Although this study focused on very few students, the issue of how much languages are used in school settings is important in practical and research terms.

In a larger study, Aguilar et al. (2020) investigated 101 students in Grades 4-6 in a Spanish-English DLI program at one school. The Grades 4-5 students received instruction in English and Spanish in equal measures of 50:50, but the ratio of English and Spanish was 60:40 for Grade 6 students. The students were administered the Core Academic Language Skills assessment of reading fluency and comprehension in both languages. The results showed that the students improved progressively in both languages. The mean scores in English and Spanish were 0.59/0.32 (Grade 4), 0.76/0.45 (Grade 5), and 0.81/0.53 (Grade 6). As can be seen, students' proficiency was better in

English than in Spanish. The finding indicated that DLI settings may not lead students to balanced proficiency in both languages in the elementary grades. Indeed, supporting students to achieve equivalent competencies in a TL and English can be a challenge.

Gómez and Cisneros (2020) interviewed principals, world language coordinators, and language acquisition directors. They found that the limited availability of curriculum and materials in TLs was one of the challenges that influence students' TL acquisition in a DLI program. These administrators noted that some teachers had to translate materials from English to the TL to augment the materials provided. Facilitating students in acquiring cultural familiarity with the TL poses an additional challenge. However, minimal research has targeted how the TL curriculum promotes students' literacy skills along with cultural understanding in DLI programs (Lindholm-Leary, 2012). This research gap underscores the importance of investigating the many dimensions to achieve a more comprehensive perspective of DLI efficacy.

The following literature review describes the development of dual language education and the student populations it has served. Dual language education includes DLI programs, which have aimed to support students' use of English and selected TLs as well as promote students' communicative and cultural competencies (Utah Dual Language Immersion, 2023b). This review focuses on research targeting intercultural communicative competence (ICC) as a theory that can inform DLI programs in reaching linguistic and cultural goals. A summary of relevant research evaluating DLI students' TL proficiency represents how the goals of DLI programs have been met. Specific attention is paid to a Chinese DLI literacy curriculum—*Mandarin Matrix*—as well as

how its texts are designed to support DLI students in developing competence in Chinese communication and culture. Finally, a scholarly discussion focuses on how the authenticity of L2 texts facilitates L2 teaching and learning and how authenticity relates to ICC.

Research in Dual Language Immersion Programs

Studies about U.S. DLI programs have targeted Spanish DLI programs more often than other languages (Lü, 2019). However, implications for Spanish DLI programs may not readily apply to non-alphabetic language programs (e.g., Chinese, Japanese). Research has shown that strategies for L2 teaching and learning may need to vary due to the differences between language systems (Chaudron, 1988; Koda, 2005; O'Malley & Chamot, 1990). For instance, Mandarin Chinese represents a different linguistic system (logographic writing) than Spanish (alphabetic writing), which entails dissimilar curricular demands and pedagogies for Chinese DLI programs. Students cannot simply transfer what they know about English reading to learning Chinese (M. Wang et al., 2003). The process of reading English words frequently encompasses construing word meanings through morphophonemic analysis, facilitated by the language's alphabetic foundation. However, deciphering Chinese logographic characters requires learners to associate and interpret units of syllables (pronunciation) and meanings (morphemes). Additionally, Chinese characters are constructed using strokes within a square formation, devoid of segmental structure and linear letter-phoneme arrangement like English (e.g., d/o/g/ and 狗). Yang (2021) documented Chinese language learners' reading fluency of

characters (number of characters read in a minute), and the results indicated that recognition of chunking units within a character serves as an essential process for fluent reading. Both Cao et al.'s (2013) and Sung and Tsai's (2019) studies demonstrated that the chunking concept can help readers establish the visual-spatial structure of characters. Chunking enables students to decompose and regroup units to read characters that have similar units and configurations (e.g., left to right ⿰ or above to below ⿱). For example, 跑, 抱, 泡 include the unit of 包, and 跳 跑, 跌 share the unit of 𧾷 (Cao et al., 2013). Thus, more research in DLI languages besides Spanish is needed to provide a more comprehensive understanding of the influence of DLI instruction, especially those targeting disparate writing structures and systems.

Bilingual Education and Dual Language Immersion Education in the United States

Historical Foundations in the U.S.

The development of DLI education in the U.S. has been influenced by socio-political events. Given its foundation in Bilingual Education (BE), ongoing social and political situations have placed dual language education in a complex context. BE in the U.S. initially served English-limited children. At the outset, bilingual or multilingual programs were established to respond to European immigrants coming to the U.S. during the 18th and 19th centuries. For specific populations, instruction was provided in various European languages such as German, French, Spanish, and Scandinavian tongues (Genesee & Lindholm-Leary, 2008; Malakoff & Hakuta, 1990). Nevertheless, instruction

of languages other than English was not a prominent issue in state and federal education policy during the 19th century. Significant changes in foreign-language (FL) education in the U.S. followed three major sociopolitical events–World War I (WWI), World War II (WWII), and the Soviet Union's launch of Sputnik and the commensurate space race (Pavlenko, 2003).

From the colonial era, the U.S. has been linguistically diverse. FL instruction in educational institutions was established from the late 17th century and continued sporadically until WWI. In the early 20th century, U.S.'s antagonism toward Germany affected many states' decisions to prohibit FL education, making monolingualism (English-only instruction) mandatory in most elementary schools (Freeman et al., 2005; Ovando, 2003; Wiley & García, 2016). Within the context of WWII, FL education was reawakened to respond to military service and political needs. The government recognized the need for equipping personnel with speaking proficiency in FL via intensive training (Carroll, 1962; Zeydel, 1964). In addition, a legal effort attempting to promote bilingual education was the landmark lawsuit-*Brown v. Board* of Education in 1954. Later, the National Defense Education Act (NDEA) of 1959 included providing funds for educational improvement to support all levels of science, math, and foreign language education (Flemming, 1960; Savignon, 2018). The Civil Rights Act of 1964 declared no discrimination should occur in educational funding for any ethnicities (O. García & Sung, 2018). Afterward, Senator Ralph Yarborough of Texas proposed a bill providing educational programs for Spanish-speaking students. This bill ushered in Title VII of the Elementary and Secondary Education Act (ESEA) of 1965 and the Bilingual

Education Act (BEA) enacted in 1968 (García & Sung, 2018; Savignon, 2018; Stewner-Manzanares, 1988). The Bilingual Education Act was the first federal consideration of English-limited students' educational needs and allowed federal funding for bilingual programs. Section 704 of this law announced available grants for "programs to impart to students a knowledge of the history and culture associated with their languages" (PL 90-247 Title VII, Sec. 704, as cited in Malakoff & Hakuta, 1990). This important legislation paved a way for BE via "instruction in a language other than English as well as cultural awareness" (Stewner-Manzanares, 1988, p. 1).

Concurrently, the Canadian style of French/English instruction in Quebec, Canada influenced U.S. educators to offer students dual language education. The Coral Way Elementary School was established for children of Cuban refugees in Florida to promote native language retention and English proficiency. It set a model as the first official BE program in the nation. In 1971, a Spanish/English immersion program in Culver City in California was established to support Anglo and Latino students. At the time, Chinese, French, and Portuguese were also suggested for immersion programs although they were not yet well developed (Cohen, 1974).

In 1974, a Supreme Court case, *Lau v. Nichols,* (Gándara & Escamilla, 2017; Stewner-Manzanares, 1988; Sugarman & Widess, 1974) pushed U.S. school systems to provide bilingual instruction and supplementary materials for non-native English-speaking students. This decision paved the pathway for later DLI programs. Thereafter, the federal government supported bilingual instruction, and many states authorized local schools to provide various bilingual programs primarily featuring Spanish-English

bilingual programs to support Spanish-speaking children in American public schools (Gamson et al., 2015; Genesee & Lindholm-Leary, 2008).

Various Models of Bilingual Education Programs

Although BE efforts made progress via legal cases and education policies, the battle between BE and anti-bilingualism proponents has influenced U.S. school systems to pursue various ways to meet students' language needs, ranging from English-only to several models of bilingual education. For instance, English immersion, ESL programs, transitional BE, and early–exit BE programs were designed to focus on developing English proficiency. Given this mission, such programs were more of a subtractive approach in which attention to students' L1 proficiency was decreased while exposure to English increased as students moved through the grades.

Contrarily, enriched immersion, maintenance, and late-exit programs are considered additive models emphasizing students' bilingualism and biliteracy (Fortune & Tedick, 2008; Freeman et al., 2005). These models established an important principle that would eventually guide dual language programs – simultaneously learning L1 and L2 in core subjects: math, science, and social studies. This type of instruction is designed to develop students' bilingual, biliterate, and cross-cultural competencies (Gándara & Escamilla, 2017). While BE programs have mostly focused on English learners, dual language programs have become an option for both English-speaking and non-English-speaking students in the U.S. Differences among various BE and dual language programs are summarized in Table 2.1.

Table 2.1

Types of Language Programs

Program type	Program goals	Instructional model	Amount of TL and English exposure	Student population
Sheltered English	Support English learners to acquire English and content knowledge	Content-Based ESL	100% English	100 % English learners (ELs) or a mix of ELs and non-ELs
ESL Pull-out Traditional Instruction	Support ELs' integration into all-English mainstream classrooms	ESL/Subtractive model: Students are pulled out of their regular classrooms to be given specialized instruction on basic vocabulary and language structure in English.	100% English	Identified and eligible ELs
ESL Pull-out and Pull-in Content Instruction	Support ELs to integrate into all-English mainstream classrooms.	ESL/Subtractive model: ELs receive 2-3 years of content support service in English.	100% English	ELs
English Immersion; Structured English Immersion	Help ELs acquire English proficiency and content knowledge	Subtractive model: ELs do not receive special services.	100% English	Mix of ELs and non-ELs.
Transitional Bilingual Education (TBE): Early-exit Bilingual Education	Support ELs to integrate into all-English mainstream classrooms	Paired Bilingual/Subtractive model for ELs: Content-based instruction (CBI) in L1 from Grade K or 1, then phased out by year 3 and becoming 100 % English	Initially, L1 instruction: 90% and English instruction: 10%	ELs
Maintenance Late-exit Bilingual Programs/ Developmental Bilingual Education	Support ELs in becoming bilingual and biliterate (L1 and English).	Bilingual/Additive model: CBI in English and L1 for 4 to 6 years from Grade K or 1	L1 instruction: ≥50%	Multilinguals or ELs who pursue their L1 as TL

(*table continues*)

Program type	Program goals	Instructional model	Amount of TL and English exposure	Student population
Indigenous Immersion/Aboriginal Immersion/Heritage Language Immersion	Restore and revitalize Native students' indigenous or immigrant language and culture (e.g., Navajo or Spanish in the U.S.).	Bilingual/Additive model: Instruction in native or immigrant languages English instruction increases from Grade 2 students receive all-English instruction by Grade 6.	Native or immigrant languages and English	Native or immigrant children; Mixed groups of native or immigrant students and English-speaking students
One-Way Foreign/World Language Immersion/ One-way Dual Language/One-way Immersion (OWI)/ Enriched Immersion	Support students to develop bilingualism, biliteracy, and biculturalism. Help students develop an understanding and appreciation of diverse cultures.	Bilingual/Additive model: CBI in English and TL Various amounts of TL instruction: *Partial immersion:* ≥ 50% *Total immersion*:100% *Early immersion*: Grade K or 1 *Delayed immersion*: Middle school *Late immersion*: High school	The ratio of English and TL varies: *Total immersion*: 100:0 *Partial immersion*: 90:10, 80:20, or 50:50	Speakers of the majority language of the society, which can include some minority learners, ELs, or heritage language learners of the TL.
Two-way Bilingual Two-way Immersion (TWI); Two-way Dual Language Programs; Dual Language Immersion (DLI)	Support students to develop bilingualism, biliteracy, and biculturalism with competency in two languages. Help students develop an understanding and appreciation of diverse cultures.	Bilingual/Additive model CBI in English and TL	L1 and English instruction: 90:10 or 50:50.	Typically, 50:50 for ELs and non-ELs students Require ≥30% of ELs or non-ELs

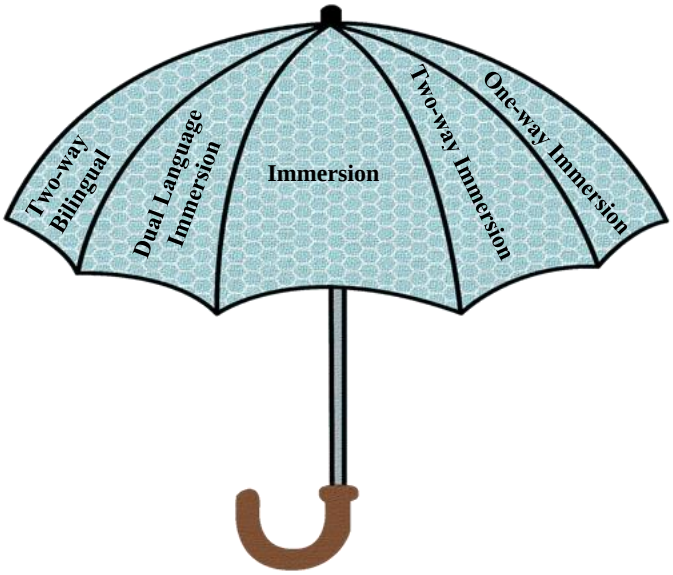
Note. Resources are adapted from Freeman et al. (2005); Tedick & Lyster (2020); and U.S. Department of Education (2015).

Dual Language Immersion Programs in the United States

American DLI programs adhere to the fundamental principles and design of BE in an inclusive way regarding instructional models and teaching practices. DLI programs follow the two-language model (also referred to as two-way immersion, two-way bilingual, or dual- language model) and serve both minority and majority language students. The model promotes acquisition of English and a targeted language (Genesee & Lindholm-Leary, 2008; Wiley & García, 2016). The variations of immersion programs, shown below in Figure 2.1, are influenced by student populations, different ratios of instruction in English and the TL, and instructional models. Importantly, within these options, differences include the roles of L1 and L2 in learning core subjects (e.g., math, science, and social studies).

Figure 2.1

Variations of Immersion Programs



Note. Adapted from Tedick & Lyster (2020).

Common Goals Within Varied Dual Language Immersion Program Models

The structure and implementation of DLI programs may vary, but there are three commonly shared goals: (1) to achieve high levels of proficiency in two languages; (2) to attain grade-level academic achievement in English and target language; (3) to develop cultural and intercultural competence or understanding (Christian, 2016; Li et al., 2016; W. P. Thomas & Collier, 2017; U.S. Department of Education, 2015).

Despite these common goals, models in DLI programs can differ by the language offered, and the portions of a school day designated for both languages. In the U.S., Spanish DLI is the most implemented program (30 states) followed by Chinese DLI (13 states): other languages are also available, including French, Japanese, German, Portuguese, Hawaiian, Korean, and Russian (U.S. Department of Education, 2015). Currently, there are 27 languages offered in the U.S. public schools' DLI programs. In the 2021-2022 school year, California, Texas, New York, and Utah had the most DLI programs in their public schools (American Councils Research Center [ARC], 2021).

Within DLI programs featuring different languages, there can be dissimilar ratios of exposure to the TL. The most common two models include ratios of TL and English of 90:10 or 50:50 (Genesee & Lindholm-Leary, 2008; U.S. Department of Education, 2015). In the 90:10 model, students begin receiving intensive instruction in the TL during the primary grades and English instructional time gradually increases to 50% by Grade 5 or 6. The 50:50 model generally provides 50% of instruction in each language for students throughout elementary grades (Collier & Thomas, 2004; Lindholm-Leary, 2012).

The nature of the student population also differentiates DLI models as two-way

and one-way immersion programs. Two-way models ideally comprise two groups of students. Half are TL speakers, and the other half are English-dominant students. The two-way models may be seen as ELs and non-ELs with similar opportunities for learning both languages. Programs with two-way models and sufficient student representation can foster students' cross-cultural understanding through formal instruction and peer interaction. When the 50:50 student ratio cannot be met, at least 1/3 of students should be accounted for in either group to have sufficient peers for interaction and TL facilitation (Lindholm-Leary, 2012; W. P. Thomas & Collier, 2017; U.S. Department of Education, 2015).

One-way models generally consist of students from one language group who speak the dominant societal language but also seek to acquire a targeted language (Lü, 2019). Such models usually serve English proficient speakers who learn the TL as an L2, world language, or heritage language (e.g., Spanish, Chinese, or French). Ratios of TL and English time vary in one-way models including total immersion and partial immersion with ratios of 90:10, 80:20, or 50:50 in the program.

Benefits of Dual Language Immersion Programs

Research has shown that DLI is beneficial to students (Espinosa, 2013) because such programs appear to enhance students' executive control (Esposito & Baker-Ward, 2013; Kalia et al., 2019), L1 and L2 performances (Collier & Thomas, 2017), and academic achievement in content areas (Bialystok, 2018; Marian et al., 2013; Padilla et al., 2013; Steele, et al., 2017). Esposito and Baker-Ward (2013) compared Kindergarten,

Grade 2, and Grade 4 students in an English-Spanish DLI program and students from English-only classrooms to determine whether exposure to dual-language instruction could lead to improvements in cognitive flexibility, working memory, and inhibitory control. Students' executive function skills were assessed through the Sun/Moon Task (responding to varying combinations of sun and moon stimuli) and the Trail Making Task with two parts (connecting numbered circles in ascending order and alternating between numbers and letters). The authors found that children in dual language education programs demonstrated better performance in the two tasks compared to their monolingual peers, which highlighted that dual language education may positively contribute to development of executive function skills. Similarly, Kalia et al. (2019) investigated the interplay between vocabulary development and executive function skills in Spanish–English dual-language learners. They compared DLI and non-DLI students' (ranging from 5.70 to 9.72 years old) performances on executive function skills through tasks measuring inhibitory control and working memory. The study found that students with larger vocabularies in L2 tended to have better performance in these two cognitive abilities.

Psychologically, students in DLI settings have demonstrated better social-emotional competence, which in turn can enhance their problem-solving abilities, self-regulation, and sense of self-identity (Parker, 2021). Parker compared students' emotional skills in two different cohorts of K-3 English/Spanish DLI students and their peers learning in English-only classrooms. Parker utilized the DESSA-Mini form (LeBuffe et al., 2018) comprising eight items, with each item scaled from 0 to 4 (0 =

Never, 1 = Rarely, 2 = Occasionally, 3 = Frequently, 4 = Very Frequently). A structured discussion was also held to understand teachers' observations about students' social and emotional learning in the classroom. The findings revealed that overall DLI students showed more persistence than their peers in regular classrooms when facing difficulties in learning new concepts.

Dual Language Immersion Students' General Academic Outcomes in the United States

Collier and Thomas (2017) summarized 32 years of research data from 16 states including data from over 7.5 million students. The large-scale data collected from 36 school districts between 1985-2017, indicated that DLI programs have been the most effective learning settings for closing academic gaps between ELs and English-native students. One conclusion is that the DLI model enables students to learn the school curriculum through their L1 and L2. Data show that students can develop their L1 and acquire L2 simultaneously while learning grade-level content. Thus, providing students with L1 and L2 instruction benefits their cognitive growth and can lead to high-level achievement in academic subjects over time. Cummins (1991) also summarized findings from studies about the effect of L1 on L2 acquisition, which highlighted that L1 cognitive and literacy skills play a significant role in L2 development. Importantly, Cummins (1991) found that the similarity between L1 and L2 writing systems did not matter. Analysis of the L1's contribution to L2 shows strong correlations between Chinese and Japanese, Chinese and English, Cantonese and English, Spanish and English, Vietnamese and Japanese, and Finnish and Swedish. However, Collier and Thomas (2017) mentioned

that continuing L1 development to "a cognitive threshold" (pp. 208-209) takes time and a commitment of at least 6 years.

Marian et al. (2013) found that Spanish-English two-way immersion (TWI) students in Grades 3-5 outperformed non-immersion students (enrolling in a transitional program learning English as L2 or an English-only mainstream classroom) in reading and math on annual standardized tests. Additionally, their findings indicated that the disparity in reading and math scores between these two groups became more pronounced in higher grades. Similarly, Steele et al. (2017) conducted a study involving 19 schools that implemented DLI programs including Japanese, Mandarin, Russian, and Spanish. The researchers analyzed the annual standardized test scores of K-6 students in both DLI and non-DLI classrooms across math, science, and English reading. The findings demonstrated that DLI students consistently attained higher scores compared to their non-DLI counterparts.

However, Padilla et al. (2013) found that Grades 2-5 students in a two-way English/Chinese DLI program did not exceed their non-immersion counterparts in science. The results indicated that 93% of non-DLI students and 92% of DLI students achieved a proficient or advanced level on standard science tests. It is possible that the students' language proficiency in scientific vocabulary (Townsend et al., 2018), science experiences (Gelman & Brenneman, 2004), and their teachers' instructional approaches (Townsend et al., 2018; Triyuni, 2016) influenced their science learning outcomes for both groups.

Bialystok (2018) reviewed empirical studies focusing on U.S. students' early

years of bilingual schooling (K-3) including dual language programs. She found that students with low socioeconomic status (SES) performed as well or better in mathematics and English than their peers in English-only classrooms. She also indicated that the students receiving dual-language instruction made more rapid progress across grades in English and math than those in regular (English-only) classrooms. This finding suggests that dual language programs are not harmful to students with social disadvantages. Instead, DLI programs can serve to close the initial academic gap with other students (Collier & Thomas, 2017; Polanco & Luft de Baker, 2018; Watzinger-Tharp, Swenson, & Mayne, 2018). Despite these studies showing encouraging results regarding DLI students' academic performance, there are some notable limitations in these studies.

Limitations of Previous Research

Except for Padilla et al.'s (2013) research, the preceding studies and much previous research have targeted Spanish-English immersion programs (e.g., Collier & Thomas, 2017; Marian et al., 2013; Polanco & Baker, 2018). Although Steele et al. (2017) studied various DLI programs encompassing multiple languages, the data pertaining to Spanish DLI programs was larger than that for DLI programs in other languages. In a similar vein, Bialystok's (2018) review of BE also focused on Spanish-English bilingual programs and placed less emphasis on dual-language or bilingual programs in other languages. This unbalanced emphasis might be attributed to the relatively limited availability of research studying programs in other languages. In addition, most of these studies were conducted with small-scale sample sizes, posing challenges in generalizing their findings to broader contexts or populations.

Regarding sample sizes in previous studies, Padilla et al.'s (2013) study exhibited notable disparities in collected samples; immersion students in Grades 3 (N = 55) and Grade 5 (N = 13) were far fewer than their non-immersion peers (N = 304 for Grade 3 and N = 82 for Grade 5). The sample size of non-immersion greatly surpassed immersion students, particularly among fifth-grade students, which can challenge finding statistically significant differences. As indicated by the researchers, this factor might have played a role in the insignificant difference observed in t-tests when comparing mean scores (z scores) on the English language arts assessment. Additionally, the result of their small-scale study only involving K-1 students (N = 40) might not generalize to other English-Chinese DLI programs.

Similarly, Marian et al.'s (2013) study had great inequality between the numbers of minority-language Spanish-speaking students (N = 157) and English-speaking students (N = 1,852). Moreover, the number of Spanish-speaking students enrolled in the two-way immersion program (N = 134) exceeded those in the transitional program of instruction classrooms (N = 23). Conversely, the count of English-native students enrolling in the two-way immersion program (N = 75) was considerably lower than those in traditional and English-only classrooms (N = 1,777). Such unequal sample sizes in the comparison groups may introduce underlying selection bias, potentially distorting the study's findings (Johnson & Christensen, 2017). First, the positive results favoring the two-way immersion program may not represent all Spanish-speaking or English-native students. Students with lower academic achievement might have either dropped out of the program or never enrolled in it. Furthermore, there were fewer English-native students raised in

families with low socio-economic status. Thus, such students might have had access to more learning resources compared to their peers in monolingual classrooms. For example, parental support for students' language proficiency in English can be a crucial factor influencing students' learning outcomes. Encouraging and facilitating children's language-rich interactions contributes to language acquisition. More specifically, engaging children in conversations, sharing reading experiences, and exposing them to diverse linguistic contexts can enhance their vocabulary, fluency, and comprehension of English (Bialystok, 2018).

Utah Dual Language Immersion Programs

Utah Dual Language Immersion Program Beginnings

In 2008, the Utah Senate initiated DLI programs by passing Senate Bill 41. This legislation provided funding to Utah schools to establish DLI programs in Chinese, French, and Spanish. These efforts were extended when Jon Huntsman Jr. paved pathways for Utah K-12 DLI programs by initiating the Governor's Language Summit and the Governor's World Language Council (Utah Dual Language Immersion, 2023c). He declared that "being a multicultural person—or at least a citizen of the world—is in the very foundation of everything we do here" (Huntsman, 2009, as cited in Talbot & Robert, 2009, p. i). In the same vein, Governor Gary Herbert stated that "world language acquisition is now an essential skill for global competitiveness" (as cited in Talbot & Robert, 2009, p. ii). These statements highlighted the aims of Utah DLI programs and propelled their growth. From 2009 to 2015, Utah DLI programs grew rapidly. In the Fall

2014, the state already had 118 public schools with more than 25,000 students enrolling in Chinese, French, German, Portuguese, and Spanish DLI programs (Leite & Cook, 2015). Governor Herbert then challenged Utah to implement 160 DLI programs during the 2016-2017 academic year (Sung & Tsai, 2019). This challenge was fulfilled. Within years, the number of DLI schools reached 224 enrolling roughly 34,000 students (Steele, et al., 2019). Recent data from the Utah State Board of Education's annual report in 2023 revealed that 325 Utah schools have implemented DLI programs featuring languages including Chinese, French, German, Portuguese, Spanish, and Russian. Among the 325 participating schools, the numbers of students enrolled in Spanish and Chinese DLI programs between 2019 and 2023 have surpassed other target languages, as noted in Table 2.2.

Table 2.2

Utah Dual Language Immersion Student Enrollment From 2019 to 2023

Language	2019	2020	2021	2022	2023
Spanish	29,358	32,081	34,520	37,287	38,791
Chinese	14,733	16,428	18,137	19,683	20,675
French	6,787	7,449	8,131	8,780	9,198
Portuguese	2,009	2,462	2,915	3,368	3,821
German	455	552	643	734	825
Russian	120	180	240	300	360

*Note. A*dapted from Utah State Board of Education (2023).

Utah DLI programs are designed to support students' grade-level academic achievement and language proficiency by allowing students to receive dual-language instructions simultaneously without compromising their learning of core subjects (Utah

State Board of Education, 2023). The following section describes instructional models that Utah DLI programs have implemented at the elementary and secondary levels to support students in acquiring English and a TL, academic knowledge in the subject areas, and cultural awareness.

Current Utah Dual Language Immersion Models

The instructional model for Utah DLI programs follows a two-way or one-way approach with a 50:50 teaching ratio (Bell'Aver & Rabelo, 2020). The students attending are English-native speakers and English learners (ELs) enrolled in DLI programs to learn Spanish, Chinese, French, Portuguese, German, or Russian as an additional language. (Utah Dual Language Immersion, 2021). Essentially, elementary school students spend half the school day with instruction in English and half in the selected TL.

In secondary schools, students are offered foreign language (FL) classes instead of following the half-day DLI model for elementary school students. Their dual-language instruction focuses on world language and culture, history, and media. The TL teachers at each level are required to have a teaching license, world language or DLI endorsement, and at least advanced-mid oral proficiency to teach. The proportions of instruction across the elementary, middle, and upper grades are summarized in Table 2.3.

Utah Dual Language Immersion Students' Academic Achievement

Research specifically concerning Utah DLI students' academic achievement has yielded positive results (Campbell, 2022; Steele, et al., 2019; Watzinger-Tharp, Swenson, & Mayne, 2018). The Utah State Board of Education's annual reports from 2016 to 2022

Table 2.3

Target Language (TL) and English Instructional Schedule of Utah DLI Programs

Grade	Language	Subject	Instructional time
1-3	Target Language	20% Math 15% Science/Social Studies 15% TL Literacy	60 minutes a day, 4 days a week 30 minutes a day, 2 days a week 50 minutes a day, 4 days a week
1-3	English	35 % Language Art 15 % Math Review	District ELA block 20 minutes a day, 4 days a week
4-5	Target Language	8.5% Math Review 16.5% Science 25% TL Literacy	20 min a day, 4 days a week 45 min a day, 3 days a week 75 min a day, 4 days a week
4-5	English	25% Language Art 16.5% Math 8.5% Social Studies/Science Review	District ELA block District Math Block District Social Studies Block
6	Target Language	*Elementary Schools:* 25%: Science (10%)/Social Studies (10%)/Math (5%) 25% TL Literacy *Middle Schools:* DLI 2/Social Studies	50 min a day, 4 days a week 75 min a day, 4 days a week Follow Middle School class block
6	English	*Elementary Schools*: 20.75% English Language Art 20.75% Math 8.5% Social Studies/Science Review	District ELA block District Math Block District Social Studies Block
7	Target Language	*Required course:* Level 3 World Language DLI *Elective course:* DLI Culture, History, and Media	
8	Target Language	*Required course:* Level 4 World Language DLI *Elective course:* DLI Culture, History, and Media	
9	Target Language	*Required course:* Level 5 World Language DLI *Elective course:* DLI Culture, History, and Media	
10	Target Language	*Elective course:* AP Language and Culture (1.0 High School credit)	
10-12	Target Language	*Required course:* 3000 Level Bridge Course in each grade is #1, #2, and #3	
11-12	Target Language	*Required course:* 3000 Level Bridge Course in each grade is #1, #2, and #3	

Note. The schedule is adapted from Utah Dual Language Immersion (2023d, 2024). Each 3000 Level Bridge Course is worth 3 university credits and 1.0 high-school credit.

indicate that more DLI students across all language DLI programs have achieved grade-level proficiency or above in English (language arts), math, and science than non-DLI peers. Existing studies show that DLI students' (Chinese, French, and Spanish DLI programs) mean scores in language arts, mathematics, and science on standardized assessments have exceeded that of comparable non-DLI students. Positive results also have been shown for English learners in DLI programs when compared to non-DLI English learners. According to Campbell (2022), emergent English learners in a rural DLI program performed as well or better on core subjects (e.g., math and language art) and overall grade point average (GPA) compared to their non-DLI emergent English peers. These findings demonstrate that Utah DLI instructional models can successfully prepare students to achieve academically. Nevertheless, it is worth noting that Watzinger-Tharp, Swenson, and Mayne (2018) reported that Grade 4 DLI students achieved lower scores than non-DLI students in science, but they exhibited more rapid growth in fifth grade than their non-DLI peers. This suggests that the effect of Utah DLI models on students' performance can be measured in different ways, competency likely accrues over time, and merits further research to gain a more comprehensive understanding.

Utah Dual Language Immersion Students' Language Proficiency Goals

The Utah roadmap for DLI students is to support them in reaching novice high to intermediate levels of language competence in secondary schools (Talbot & Robert, 2009). Utah DLI administrators have established commensurate language goals for K-12 students. However, Chinese and Russian DLI students' goals differ slightly from those

for Spanish, German, French, and Portuguese DLI students (as shown in Table 2.4) because Chinese and Russian are more difficult for English speakers to acquire than Latinate languages. With its non-alphabetic writing system, Chinese is categorized as a level-IV (exceptionally difficult) language for English speakers. Russian is categorized as a level-III (difficult) language by the U.S. Department of State (n.d.), in part because it uses the Cyrillic alphabet, which is more distant from English than languages using Latin script (Abdualieva & Sharipova, 2021; Sokolova & Plisov, 2019).

Table 2.4

Utah DLI Proficiency Goals (French, German, Portuguese, Spanish, Chinese, and Russian)

	Interpretive listening		Interpersonal Speaking		Interpretive Reading		Presentational Writing	
Grade	F, G, P, S	C, R	F, G, P, S	C, R	F, G, P, S	C, R	F, G, P, S	C, R
1	N M	N M	N M	N L	N M	N L	N M	N L
2	N H	N H	N H	N M	N M	N M	N M	N M
3	I L	N H	N H	N M	N H	N M	N H	N M
4	I L	I L	I L	N H	N H	N H	N H	N H
5	I M	I L	I L	N H	I L	N H	I L	N H
6	I M	I M	I M	I L	I L	I L	I L	I L
7	I H	I M	I M	I L	I M	I L	I M	I L
8	I H	I H	I H	I M	I M	I M	I M	I M
9	A L	I H	I H	I M	I H	I M	I H	I M
10	A L	A L	A L	I H	I H	I H	I H	I M
11	A M	A L	A L	I H	A L	I H	A L	I H
12	A M	A M	A M	A L	A L	A L	A L	I H

Note. Extracted from Utah Dual Language Immersion (2014).
F = French, G = German, P = Portuguese, S = Spanish, C = Chinese, R = Russian.
NL = Novice Low, NM = Novice Mid, NH = Novice High, IL = Intermediate Low,
IM = Intermediate Mid, IH = Intermediate High, AL = Advanced Low, AM = Advanced Mid.

Utah DLI programs have tested students' TL skills using the ACTFL Assessment of Performance toward Proficiency in Language (AAPPL), a web-based assessment for evaluating K-12 students' language proficiency (ACTFL, 2023) with performance benchmarks for Grades 3-9 DLI students (Utah Dual Language Immersion, 2019). The assessment allows administrators and educators to understand students' speaking, listening, reading, and writing proficiencies from Grades 3-6 as summarized in Table 2.5.

Table 2.5

AAPPL Performance Benchmark for Utah DLI Grades 3-6 in French, German, Portuguese, Spanish, Chinese, and Russian

	Interpretive listening		Interpersonal speaking		Interpretive reading		Presentational writing	
Grade	F, G, P, S	C, R	F, G, P, S	C, R	F, G, P, S	C, R	F, G, P, S	C, R
3			N3	N2				
4	N4	N3			N3	N2	N3	N2
5			N4	N3				
6	I2	I1			I1	N4	I1	N4

Note. Utah Dual Language Immersion (2019).
F = French, G = German, P = Portuguese, S = Spanish, C = Chinese, R = Russian.
N1 = Novice Low, N2 = Novice Mid, I1 = Intermediate.

Outcomes of Utah Dual Language Immersion

Students' Language Proficiency Assessments

Utah DLI students have demonstrated notable language proficiency in French, German, Portuguese, and Spanish. However, achievement in Utah Chinese DLI programs has been less impressive. Chinese DLI students' mean scores on the AAPPL assessment for 2013-2014 through 2018-2019 were lower than those of DLI students of other languages. Chinese DLI students' language proficiencies in reading and speaking were

scored novice high, which were lower than their listening skills (intermediate level). The scores as noted in Table 2.6. show comparability among the other languages with a disparity for Chinese in all three modes. This indicates that students in Chinese DLI programs faced challenges in attaining a proficiency like their other language DLI peers. As noted previously, the different writing demands between Chinese and alphabetic-based languages could be the factor (J. Zhao, 2019). It may be important for educators and policymakers to understand the challenges and seek more effective language learning approaches tailored to the unique needs of Chinese DLI students.

Table 2.6

Average of Utah DLI Students' AAPPL Testing Mean Scores by Grade Levels

Language skills	Speaking (Grades 3 & 5)	Listening (Grades 4 & 6)	Reading (Grades 4 & 6)
Chinese	3.65	3.80	2.70
French	5.50	5.10	5.20
Portuguese	5.65	N/A	N/A
Spanish	5.25	5.60	5.90

Note. The mean scores are adapted from Watzinger-Tharp et al. (2021). Because the AAPPL testing date window was changed from Spring to Fall since 2016-2017, the writing assessment was not administered while Watzinger-Tharp, Tharp, and Rubio collected their data (from 2013 through 2019).

Additionally, the Utah State Board of Education has tabulated percentages of Utah DLI students meeting the benchmarks from 2018 to 2021 (K. Wu, personal communication, March 7, 2023). The percentages of students meeting benchmarks for the four language modes are shown in Table 2.7 (Utah State of Board Education, 2021). Although the results vary by language and grade, the data show that Grade 4 Chinese DLI students' reading proficiency was lower than that of DLI students in other languages. Notably, there were lower percentages of Grade 6 students meeting the benchmark than

other language groups on listening, reading, and writing assessments. For Grade 6 students' writing proficiency, Chinese DLI programs also had fewer students meeting the benchmark than for French and Spanish DLI programs (The Russian DLI program was established in 2017, and thus only Grades 3 to 5 students were tested in the program).

Table 2.7

Percentages of Utah DLI Students Meeting the Benchmarks in AAPPL Testing Across Grades

	Interpersonal speaking		Interpretive listening		Interpretive reading		Presentational writing	
Language skills	Grade 3	Grade 5	Grade 4	Grade 6	Grade 4	Grade 6	Grade 4	Grade 6
Chinese	87.25	93.70	92.75	61.75	86.50	49.00	82.50	69.00
French	76.50	92.50	82.50	90.50	93.75	87.75	81.50	73.75
German	76.00	92.75	85.25	86.30	90.50	80.30	75.00	55.30
Portuguese	78.50	85.00	72.00	86.25	88.50	84.50	86.00	68.25
Russian	77.66	91.00	91.50		88.50		78.00	
Spanish	85.00	91.50	83.25	87.50	91.00	82.50	84.50	77.00

Note. Adapted from Utah State Board of Education (K. Wu, personal communication, March 7, 2023).

Compared to DLI students of other languages, a higher number of Chinese DLI students achieved the benchmark for oral language skills in Grades 3 and 5, as well as for listening skills in Grade 4. The benchmark for speaking skill rises from N2 to N3 (Grades 3 to 5), while listening (N3 to I1), reading (N2 to N4), and writing (N2 to N4) benchmarks show a two-level gap, shifting from Grade 4 to Grade 6. The variances in Utah DLI benchmark scores indicate a need to understand how students are acquiring the TLs, which includes identifying elements that contribute to productive development.

Status of Utah Chinese Dual Language Immersion Programs

Currently, 12 school districts (Alpine, Box Elder, Cache County, Canyons, Davis, Granite, Jordan, Nebo, Provo, Tooele, Washington, and Weber) and two charter schools (Renaissance Academy Elementary and Middle schools) in Utah have implemented Chinese DLI programs (Asia Society, 2024; Utah Education Policy Center, n.d.). The majority of DLI students enrolling in these school districts are Caucasian English-dominant students (Sung & Tsai, 2019). Also, the students' family members generally lack Chinese language proficiency and can afford only limited support for students' Chinese acquisition. The absence of societal exposure, coupled with the language difficulty, likely contributes to the challenge of attaining linguistic and cultural proficiency. The challenge highlights the importance of strengthening Chinese DLI students' language skills via well-designed teaching materials and instruction.

Utah Chinese Dual Language Immersion Literacy Curriculum

Utah Chinese DLI programs currently require schools to use *Mandarin Matrix* (Utah Dual Language Immersion, n.d.) as the Chinese literacy curriculum. The purpose of this curriculum is to develop students' oral language, reading, writing abilities, and cultural understanding. All content purportedly aligns with the Utah Dual Language Immersion Proficiency Targets for each grade level (*Mandarin Matrix*, 2023). Teachers can access curriculum guides on the Utah Dual Language Immersion website to follow the instructional paces for each grade level (K-8).

The *Mandarin Matrix* textbooks are sequenced from foundational level for Grades

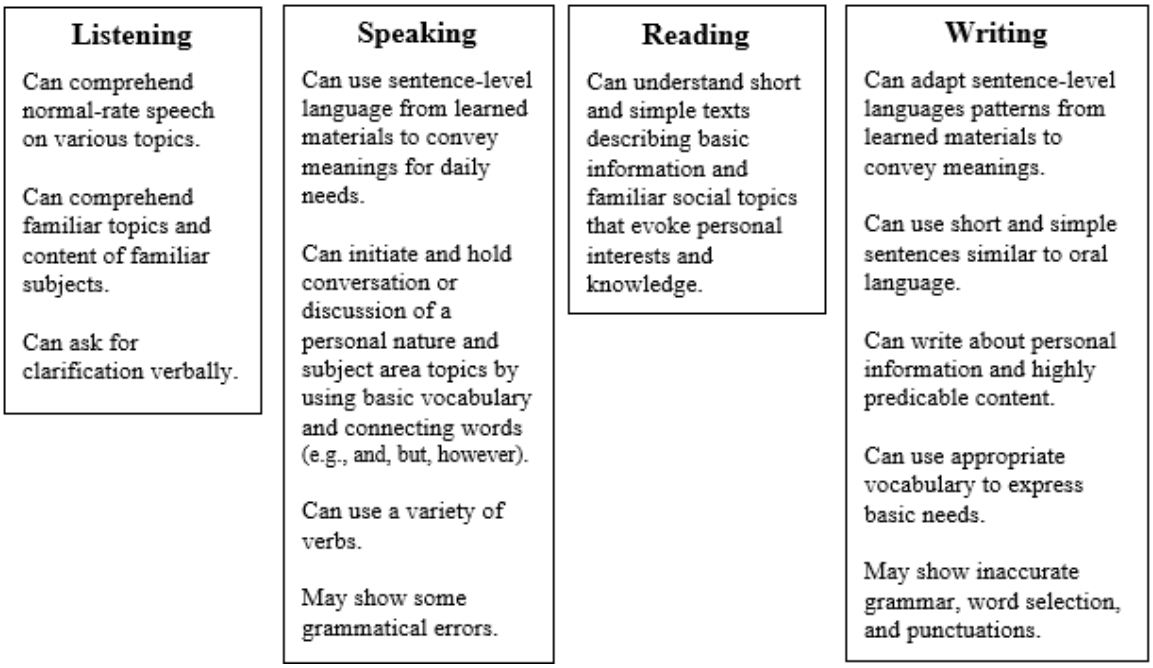
K-1 and novice level for Grades 2-4, through intermediate level for Grades 5-8 (Utah Dual Language Immersion, 2018). The foundational and novice levels of textbooks do not have a sound-annotating system presented as Romanized letters (pinyin) to help learners pronounce targeted vocabulary or phrases. Pinyin is introduced to students in third grade, but only appears in the intermediate-level books. The Romanized letters could confuse lower-grade English speakers (Grades K-2) because of incongruent pronunciations between pinyin and English letters (Hayes-Hard & Cheng, 2016). For example, /c/ in pinyin is pronounced close to /t/. If pinyin were introduced to Grade K to 2 students, it could disturb their learning of English phonics.

The series of *Mandarin Matrix* books follows a spiraled system repeating commonly used vocabulary, grammar, and sentence structure across levels. The goal is to "ensure repetition in a variety of contexts to reinforce learning outcomes" (*Mandarin Matrix*, 2023, para. 9). Utah's goal for Chinese DLI students' Chinese proficiency is to attain intermediate levels in the four language modes by Grade 10 (Utah Dual Language Immersion, 2015). By Grade 9, students' listening proficiency is expected to attain the intermediate-high level, and speaking, reading, and writing proficiencies at the intermediate-mid level. Description of each language mode is shown in Figure 2.2.

The content of the *Mandarin Matrix* books is scenario-based and intended to engage students in authentic and familiar contexts including schools, families, and neighborhood activities with realistic language (*Mandarin Matrix*, 2023, para. 1). *Mandarin Matrix* offers teachers three units with 15 days of lesson plans, curriculum maps, and student worksheets to develop students' Chinese reading and writing skills.

Figure 2.2

Grade 9 Student' Proficiency Expectations for the Four Language Modes



Note. Adapted from Utah Dual Language Immersion (2015).

Language Proficiency and Intercultural Communicative Competence

As linguistics, Chomsky (1965) and Hymes (1972) focused on language learners' abilities to use languages in real contexts, which utilize learners' linguistic competence (Byram, 2021). Chomsky indicated that competence requires knowledge to perform language functions in a specific situation. Hymes expanded Chomsky's perception of communicative behaviors, indicating that a competent language performer should be able to deliver language with appropriate actions or commensurate behaviors. Hymes's insights laid the foundation for the theory of intercultural communicative competence (ICC), emphasizing that a speaker's conduct should reflect a grasp of the sociocultural

norms, values, and attitudes associated with the language. Aligning with Hymes's claim, Swain (1985) also underscored the significance of the sociocultural contexts of the language being learned to communicate effectively. This requires learners to understand not only the linguistic forms but also the —a full range of language and interactional competencies. Ultimately, this enables learners to carry out more authentic and effective communication.

Byram's Intercultural Communicative Competence Model

The ICC model was proposed by Byram in 1997 (Byram, 1997, 2021) and developed from the theory of communicative competence (CC). The ICC model includes components of intercultural attitudes, social practices, interpreting and relating, discovery and interaction, and critical cultural awareness. Intercultural attitude refers to an individual's curiosity, openness, and willingness to understand others' viewpoints different from their own cultural beliefs and values. This entails actively seeking knowledge about the historical and contemporary relationships between one's own cultural practices and products and those of different social groups. The skills of interpreting and relating indicate the ability to understand and explain documents or events from other cultures while also relating them to familiar perspectives from one's own culture. Skills of discovery and interaction refer to abilities to acquire knowledge of other cultural practices and effectively apply this knowledge, alongside intercultural attitudes, during real-time communication and interaction. Last, critical cultural awareness denotes an individual's ability to analyze documents and events, employing

reasoning to interpret both explicit and implicit values within one's own culture and others (Byram, 2021).

Importance of Cultural Awareness in Language Use

A proficient language user not only shares linguistic knowledge but also demonstrates cultural awareness in their language use (Alptekin, 2002). For example, requesting help from others may require an individual to use "would you please…" in English or "请问你能不能 (Trans. I was wondering if you could…)" in Chinese to show politeness. This concept is informed by a theory emphasizing that "communication entails a diversity of interactions, which require various discourse practices that need sophisticated intercultural communicative competence (ICC)" (Lwanga-Lumu, 2020, p. 2).

Scholarship of the Intercultural Communicative Competence Model

According to Zorina et al. (2016), understanding and accepting the different cultures in which the language is used enables competent language learners to engage in productive and effective communication. Lussier (2007) contended that

> …to perform linguistically and (inter) culturally well in another language and culture, an individual must foresee the discovery of similarities and the acceptance of differences while developing strategies to manage misunderstanding and confrontation. (p. 316)

The acceptance of another culture allows an individual to keep their own cultural identity related to L1 but also have tolerance for unfamiliarity when contacting other cultures (Byram et al., 2002). van Ek (1986) explained this as strategic competence or discourse

competence. It means that a person knows different ways to ascertain messages from others when communication gets difficult (i.e., asking questions for clarification or rephrasing sentences). Thus, the ICC model indicates that a proficient communicator in L2 should acquire open attitudes, critical awareness, sufficient knowledge, and language skills for intercultural encounters. This is ideal but may not be easily achieved in school settings. In the case of Utah DLI programs, most students are from the same community. They may have some experience encountering people from different countries, but those experiences may not sufficiently support the development of ICC. With this concern, some researchers have more recently recommended that authentic text or materials be incorporated into the language curriculum to enhance language learners' ICC (Boummaraf & Ghouar, 2017; Garcia, 2022; K. L. Liu, 2021; Reid, 2014; Rysbekkyzy & Turganbaeva, 2022).

Utilizing Authentic Texts as a Means of Promoting Intercultural Communicative Competence

The value of authenticity has historical precedence. Akkadian Semites adopted the Sumerian language to communicate with Sumerian people around 2700 BC (Titone, 1968, as cited in Mishan, 2005). Widdowson (1998) described this as "localized language" (p. 707) typically used in a particular community, which shares cultural knowledge that is implicitly conveyed during communication. Such communication using an L2 involves acceptance, adaptation, and sharing of intercultural or multicultural knowledge (Byram, 2021).

Merchants are often motivated to develop language to conduct commerce. Without a strong reason to interact, language users may not maximize their linguistic skills. In lieu of contextual resources, language students can benefit from well-designed study materials.

Role of L2 Textbooks for Teachers and Learners

Researchers have claimed that the critical role of textbooks in language classrooms is undeniable (Ahmadi & Derakhshan, 2016; Ansary & Babaii, 2002; Mohammadi & Abdi, 2014; Richards 2001). Textbooks are viewed as curricula, in which content is preselected and structured, supporting a coherent and comprehensive learning experience for students (Alharbi, 2020; Widodo, 2018). According to Widodo (2018), textbooks or curricula are considered "educational artifact[s]" (p. 132) that provide teachers with instructional guides to design curricular tasks and activities to facilitate learners' understanding of new concepts, content and develop essential skills (Nuan, 1988). In this sense, textbooks afford a systematic framework that helps teachers and students by providing consistency and continuity, reducing the possibility of fragmented or disconnected information (Richards, 2001). It is worth noting that scholars argue that while textbooks used in language classrooms offer certain advantages, they also come with limitations. These limitations include perpetuating ideologies, simplifying real-world contexts, containing outdated information, and facing constraints in catering to diverse learning styles (Ahmadi & Derakhshan, 2016; Ansary & Babaii, 2002; Mohammadi & Abdi, 2014; Richards 2001).

Advantages of Using Textbooks

As highlighted earlier, textbooks encompass systematized instruction that tends to govern the teaching and learning timelines and align with objectives and goals (Richards & Renandya, 2002). Textbooks help teachers in lesson planning and allow learners to expect the progress of lessons and anticipate the skills they will acquire. In this regard, textbooks can be resources for teachers to use to support students' language proficiency and progress over time (Crawford, 2002). For novice teachers, textbooks can provide a sense of security and support by including organized teaching content and readily employable learning tasks (Ahmadi & Derakhshan, 2016; Ansary & Babaii, 2002). Richards (2001) noted that this characteristic of textbooks has the potential to enable inexperienced teachers to dedicate their time and effort to teaching by reducing the need for material creation.

According to Brown (1995), textbooks are beneficial as they serve as language resources and learning references. They can fulfill a function in supporting students' learning and stimulating their interest in learning. Weninger (2018) indicated that textbooks play a pivotal role in supporting instructors in teaching vocabulary, grammar, and cultural information in a systematic manner. Linguistic and cultural input has particular importance for L2 learners. Especially for those who are distanced from the environments of the target language and culture, textbooks can present the target culture through both textual and visual elements (Hong & He, 2015; Or & Shohamy, 2015; Xiong & Peng, 2021). As Or and Shohamy contended, "textbooks can be used as powerful tools for promoting critical thinking, intercultural competence, coexistence, and

more equality" (p. 122) between the target culture and learners' native culture.

Limitations of Textbook Utilization

Despite the benefits outlined above, it is essential to acknowledge that textbooks can also entail limitations. First, content in textbooks could perpetuate ideologies determined by a dominant group with political, economic, and institutional power to impose particular social beliefs and values on learners (Apple, 2019; Au, 2012; Michelson, 2018; Q. Zhang & Leahy, 2022). In this vein, textbooks may inadvertently reinforce cultural stereotypes or biases (Crawford, 2002; Michelson, 2018; Xiong & Peng, 2020).

Second, textbooks cannot address all students' various learning needs and interests. Textbooks may not adequately accommodate the range of students' proficiency levels and learning preferences, motivation, and strategies (Ahmadi & Derakhshan, 2016; Ansary & Babaii, 2002; Richards & Renanadya, 2002). For teachers, relying extensively on textbooks could confine their creativity and reduce their autonomy to tailor lessons according to the unique dynamics of their classroom and the evolving needs of their students (Crawford, 2002; Richards & Renandya, 2002).

Third, textbooks might contain inauthentic language that would hinder reaching language proficiency goals. Textbooks can, indeed, include distortion of content, leaning towards an idealized portrayal of the world, thereby sidestepping genuine yet contentious societal and global issues (Richards, 2001; Richards & Renanadya, 2002).

Finally, language and culture are ever-changing entities; some cultural norms may remain the same, however, some have changed (Peterson, 2004; Spencer-Oatey, 2012).

Static textbooks cannot reflect the latest developments or real-time linguistic nuances, potentially leaving learners with a less contemporary understanding of the language and cultures (Lee & Li, 2020; Liu, 2005). With the benefits and constraints of using textbooks in language programs, scholars have unanimously converged upon the significance of meticulously evaluating and selecting textbooks. Evaluating textbooks for language education involves concerted examination and a comprehensive understanding of how the content aligns with educational goals (Ansary & Babaii, 2002; Mohammadi & Abdi, 2014; Richards 2001).

Authenticity in L2 Textbooks for Students' Intercultural Communicative Competence Development

Within the realm of research in L2 or FL, there has been a notable emphasis on the authenticity of contextualization, linguistics, and social-cultural simulation in textbooks for learners' engagement in communicative discourses (i.e., turn-taking speech, repetition, pauses, and the occurrence of interruptions) and augmentation of language competencies (Gilmore, 2007; Mishan, 2005; Widodo, 2018; Zyzlik & Polio, 2017). Considering this perspective, certain researchers have addressed how L2 textbooks' inclusion of linguistic and cultural authenticity can support language learners in the development of ICC (Al-Najjar, 2020; Bhandari & Bhusal, 2020; Reid, 2014; Handayani & Wirza, 2021).

Al-Najjar (2020) explored how English textbooks promoted Palestinian Grade 7 students' ICC. Employing content analysis, the author used Byram's (1997) ICC model and its five components to identify whether each unit included manifestations of

intercultural attitudes, social practices, interpreting and relating, discovery and interaction, and critical cultural awareness. Adapting L. F. Gómez's (2015) study, Al-Najjar also categorized topics as source culture (i.e., learner's own culture), target culture (English culture), and international culture (cultures in countries where people use English as an international language or lingua franca). Moreover, each unit was categorized by three levels of culture: surface culture (food, holidays, or sports), intermediate culture (giving people instructions or advice, expressing promises), and deep culture (hidden perspectives that a certain community embraces). Results of the textbook analysis, the content of the textbooks substantiated Byram's five components of ICC with balanced distributions of categories and levels. Students were exposed to diverse cultural contexts with insights into global and social issues (i.e., civilization, influence of technology in different countries, and ways of communication in other cultures). The researcher concluded that such textbook design could contribute to fostering students' respect for self and others, forming intercultural identity and a sense of social responsibility to cooperate with different cultural groups.

L. F. Gómez (2015) argued that for ICC enhancement, textbooks should include both surface and deep forms of culture. Students need to learn cultural aspects related to daily life and have chances to develop invisible sociocultural perspectives that a group of people holds. For example, a Chinese proverb says "人算不如天算 (Tans., the heaven overrules despite the planning of men)," which reveals a cultural belief that things cannot be personally controlled. Chinese people tend to hold this attitude that life is eventually ruled by heavenly powers (Zhao, 2013). However, deep levels of culture can be difficult

to understand for beginning learners or those focused only on linguistic elements. Content communicating deeper aspects of culture may need to be embedded in authentic texts in a developmental way while considering learners' needs and levels (Al-Najjar, 2020; Gilmore, 2004, 2007). For this reason, the complexity of linguistic structure, the difficulty of vocabulary, the length of texts, and topic familiarity are critical elements that should be carefully edited in textbooks tailored for language learners (Zyzik & Polio, 2017).

Reid (2014) highlighted the significance of incorporating authentic content and structures in textbooks to foster learners' development of pragmatic competence and sociolinguistic knowledge. This approach allows learners to grasp language within its cultural context, mitigating the risk of misinterpreted meanings or communication breakdowns. Moreover, Reid argued for the equal importance of understanding both functional language and culturally relevant non-verbal communication. ICC includes the ability to interpret and employ non-verbal messages such as appropriate gestures, facial expressions, haptics, or indicators of approval. These paralinguistic features can vary in different cultures, so it is a vital competence to acquire in order not to present impoliteness or cause confusion and awkwardness during intercultural interactions.

Furthermore, Reid (2014) emphasized that everyday items can serve as valuable sources of authentic texts, particularly when the teaching of the TL and target culture are concurrent goals. By integrating authentic materials into language instruction, educators can provide learners with rich linguistic and cultural experiences that enhance their proficiency and cultural awareness. Scholars advocate for the incorporation of authentic

texts at all levels of language learning, recognizing their benefits for learners across proficiency levels (Gilmore, 2004; Pinner, 2019; Zyzik & Polio, 2017).

Scholarship on Authentic Texts Used in L2 Teaching

Scholars have advocated the effects of authentic texts in L2 instructional settings from multiple viewpoints. Taylor (1994) argued that authenticity and inauthenticity of texts are relative terms, not absolute features. If authenticity is the tool and the goal in language classrooms, learners should use authentic texts for real-world tasks to gain communicative competence in the TL. Mishan (2004) and Hung and Chen (2007) took a similar perspective to Taylor's view. They contended that authenticity can be created—more or less—in the classroom. The contexts can be authenticated by designing authentic activities, such as scenarios of ordering food or making an emergency call. The process of interacting with authentic texts and achieving the outcomes (language skills and cultural knowledge) can motivate learners' learning (Mishan, 2005; Zohoorian, 2015).

Zohoorian (2015) demonstrated that authentic contexts involving authentic texts and tasks can enhance English learners' motivation in an English for Academic Purpose (EAP) course. To compare students' using authentic materials and receiving traditional instruction, the researcher compared participants' self-rated motivation levels by analyzing data from a student questionnaire, students' diaries, and focus group interviews. Via independent *t*-test analysis, the mean scores of students who were exposed to authentic texts (found on different online resources, and with tasks related to authentic contexts) demonstrated higher motivation levels ($M = 275.77$; $p = .05$)

compared to the students (M = 232.77) who received instruction solely based on course EAP textbook. The qualitative data from diaries and interviews were analyzed by clustering and calculating the frequency of reoccurring themes, including typical activities, relatedness of topics, and satisfaction. The results unveiled a more favorable perception of the course among the more-authentic instruction group compared to the control group. Notably, the use of functional language derived from authentic texts and tasks correlated with students' learning motivation within the authentic group. Conversely, many students in the control group expressed dissatisfaction with textbook passages, finding them outdated, challenging, and disconnected from their interests, which presumably impeded their engagement with the course. While the outcomes favored incorporating authentic texts for increasing learning motivation, it is important to acknowledge that the study was limited to a single course involving 30 college students in each group.

Using authentic texts can also positively influence students' reading comprehension (e.g., Assiddiq, 2019; Islam & Santoso, 2018; Namaziandost et al., 2022). Islam and Santoso investigated 255 Negeri Grade 8 students' reading comprehension in nine English classes. Within a quasi-experimental and pretest-posttest research design, the experimental group received instruction integrating authentic texts (articles taken from The Jakarta Post, Hello Bali Magazine, and some online editions), while the control group was taught with controlled texts. The pretest of reading comprehension showed that the two groups were equivalent in reading abilities. After eight sessions of instruction, students took a multiple-choice reading comprehension test. The results

indicated that the authentic texts likely contributed to the experimental group's significantly higher mean score (M = 59.8) on a post-test reading comprehension test compared to the control group's score (M = 46.7). The researchers suggested that the use of realistic language in authentic texts might motivate participants to read and improve their engagement with the content. A concern in this study is the ambiguity of less-authentic texts used by the control group, which could have been from a textbook or other unspecified source. The selected topics might not be directly comparable to what the experimental group had encountered. This variable has the potential to influence the observed positive effects within the treatment group.

With a similar research design, Namaziandost et al. (2022) declared similar findings on Iranian-English learners' reading comprehension and motivation. They found that students learning from both coursebooks and authentic texts from online resources had significantly less learning anxiety (M = 34.24) than those not being taught via authentic materials (M = 57.68). Foreign language anxiety can arise due to factors such as low FL learning motivation, poor performance, and inadequate achievement (Horwitz et al., 1986). However, the relationships among FL reading anxiety, motivation, and comprehension are subject to various influences such as teacher-student interactions, learners' beliefs, and teacher support or feedback (Asif, 2017; Horwitz et al., 1986). Although a complex issue, Namaziandost et al. highlighted that the nature of texts that learners encounter may play a role in shaping positive or negative experiences in FL reading.

Based on the reviewed research, it is evident that the features of authentic texts

can provide advantages for FL or L2 learning. However, other factors such as teachers' instruction, scaffolding, and students' grade levels could also contribute to language learning in differential ways (Qi, 2021). For example, Shastina et al. (2017) reported that 35 % of participants expressed a decrease in their learning motivation when faced with the challenges in comprehending authentic texts independently, without receiving teachers' help and support.

Using a survey and semi-structured interviews, S. Huang (2018) investigated 14 third-year university students' perceptions of reading authentic texts in an L2 Chinese course. The mean and median scores of survey data indicated that students perceived that integrating authentic texts as supplementary reading materials positively improved their reading abilities, general grammar and vocabulary used in real-life situations, understanding Chinese culture, and learning motivation. However, the data from interviews showed that some students preferred a more balanced use of coursebooks and authentic materials. The main reason was that coursebooks reinforced their language practice, but authentic materials helped them connect to Chinese culture. Like Shastina et al.'s (2017) study, the students did not read authentic texts independently. The difficulty of the selected authentic texts required learners to receive timely scaffolded instruction from the teachers, which included activities such as previewing new words, explaining complex language structures, and facilitating the comprehension of main ideas rather than being fixated on minute details (Namaziandost et al., 2022). These pedagogical strategies suggest that text comprehension is a fundamental step for learners to enjoy learning and gain meaningful learning outcomes from authentic content (Namaziandost et al., 2022;

Shastina et al., 2017). Hence, while authentic texts can mirror real-life language use, it is worthwhile to contemplate offering learners strategies for dealing with challenging portions within such texts.

The benefits of using a textbook that embeds authentic texts versus using authentic materials as supplementary resources merits study. This concern should be considered when designing a curriculum for L2/FL learners. The use of authentic texts is important in L2 learning settings, but providing learners with opportunities to practice the language is also crucial (Parsons & Ward, 2011; Siegel, 2014; Zyzik & Polio, 2017). Nevertheless, the studies mentioned generally focused on short-term effects. Investigating the potential long-term impact of using authentic texts or integrating them into curricula could provide valuable insights into sustained learning benefits. Additionally, various language proficiency levels or learning styles of students could influence the effectiveness of using authentic texts. Including a more diverse range of participants for studies could be worthwhile. Finally, studies could better address how authentic texts help learners develop cultural sensitivity. Addressing these possible gaps could lead to more comprehensive and nuanced understanding regarding the use of authentic texts in language learning contexts.

Worthwhile Directions for Dual Language Immersion Research and Instruction

In focusing on the Utah Chinese DLI setting, in the present study, the goal was to evaluate the extent that the Chinese DLI literacy curriculum—*Mandarin Matrix*—

presents linguistic and cultural authenticity. The curriculum has been used for Utah DLI Chinese students up to the secondary level. However, a systematic evaluation specifically focusing on the authenticity of content had not yet been conducted. Thus, how teaching Chinese as an L2 via the *Mandarin Matrix* materials supports teachers in helping students learn authentic language and culture is not yet well understood.

Using authentic texts in L2/FL teaching can bring benefits, but including such materials in the required curriculum is not a simple task for L2 curriculum designers and instructors. One difficulty is what proportion and extent of authentic materials or texts should be integrated for L2/FL programs. However, the literature about textual authenticity for teaching languages other than English, including Chinese (S. Huang, 2018; Zhang & Leahy, 2022), French (Eghtesad, 2018), German (Shastina et al., 2017), or Portuguese (Bateman et al., 2020) is quite limited. Existing relevant studies provide empirical investigations of the L2 teaching curriculum, but none of them includes DLI students. In tandem with the goal of conducting a methodical investigation of the *Mandarin Matrix* books (K-6), obtaining teachers' perceptions of how the curriculum's instructional resources serve to develop students' communicative and cultural competencies can inform the field. The findings of a content analysis of the *Mandarin Matrix* books and an accompanying teacher survey can also inform the Utah Chinese program regarding the content of the *Mandarin Matrix* textbooks and its capacity for enhancing students' language proficiency and ICC.

CHAPTER 3

METHODS

This study sought to investigate the level of authenticity of the Utah Chinese DLI literacy curriculum as embedded in the *Mandarin Matrix* textbooks. L2 researchers and practitioners have contended the importance of authentic content in textbooks for supporting L2 learners' language proficiency and communicative competence (Gilmore, 2007, Mishan, 2017; Pinner, 2015; van Lier, 2013). The goal of the Utah DLI program is that students achieve high communicative competence in the TL as well as grade-level content knowledge of mathematics for Grades 1 to 3 and science for Grades 4 to 6 (Spicer-Escalante, 2017; Watzinger-Tharp & Leite, 2017). However, these claimed goals could be difficult to achieve if the main textbooks are not designed to align with them. Thus, there is a need to examine how the texts parallel DLI's goals for students in terms of promoting authentic language, ICC, and academic information. To evaluate the language textbooks, previous studies (e.g., Al-Najjar, 2020; Hong & He, 2015; P. Huang, 2019; Moss et al., 2015; Or & Shohamy, 2015; Weninger, 2018) that employed content analyses served as resources to support the proposed analytical process. The analysis focused on examining content by identifying units of authentic words, word order, representative situations, and cultural mores from the foundational to the intermediate level of the *Mandarin Matrix* textbooks, Grades K-6. The following research questions guided the analysis.

Research Questions

1. How linguistically authentic (to native Chinese) is the linguistic content of the *Mandarin Matrix* K-6 textbooks?
    a. How authentic (to native Chinese) is the word-level content of the *Mandarin Matrix* K-6 textbooks?
    b. How authentic (to native Chinese) is the sentence-level content of the *Mandarin Matrix* K-6 textbooks?
2. How culturally authentic (to native Chinese cultures) are the *Mandarin Matrix* K-6 textbooks?
    a. How culturally authentic are the communicative messages of the characters in the *Mandarin Matrix* K-6 textbooks?
    b. How culturally authentic are settings presented in the *Mandarin Matrix* K-6 textbooks?
    c. How culturally authentic are the behaviors of the characters used in the *Mandarin Matrix* K-6 textbooks?
3. Do the *Mandarin Matrix* textbooks increase in linguistic and cultural authenticity across the K-6 grade levels?
4. What are the perceptions of K-6 Utah Chinese DLI teachers using the *Mandarin Matrix* textbooks for Chinese teaching and learning?

Addressing these questions should help Chinese literacy curriculum developers seeking to design content that is sufficiently authentic and communicatively oriented. Classroom teachers might also benefit from analyses of the textbooks so that the content could be maximized or supplemented with related materials.

Research Design

The research design for this study combined two sources of data: quantifying the frequency of linguistically and culturally authentic content across K-6 *Mandarin Matrix*

textbooks, as well as a teacher survey used to investigate Utah K-6 Chinese DLI teachers' perceptions about how the *Mandarin Matrix* texts represent pragmatic language usage and Chinese culture. The analytical process for linguistic and cultural authenticity for this study was largely derived from the study conducted by Hong and He (2015). Their research aimed at identifying Chinese ideologies and culture within three textbooks designed for Chinese language learners.

Textbook Content Analysis

Content analysis is a systematic methodology for studying human communication including textual, visual, and auditory forms (Weniger & Kiss, 2015). According to Krippendorf (2004), a content analysis utilizes "available analytical or computational procedures" (p. 150) to help researchers understand "the experiences of reading text, interpreting images, and observing transient social phenomena of interest" (p. 150). Per Krippendorf's (2019) definition, content analysis is a "research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use" (p. 24). In this study, the process of content analysis involved evaluating textual content, including language-based data and images, to investigate the level of authenticity with respect to both linguistic and cultural affordances.

Data Collecting Procedures

The content analysis featured in this study aimed to investigate how the K-6 *Mandarin Matrix* textbooks serve as authentic representations for students learning Chinese as an L2 in the Utah Chinese DLI program. Specifically, the analysis focused on

evaluating the authenticity of the current K-6 textbooks. However, a newer edition of the program is under development. At the time of the study, only the Grade 6 books were updated versions. Printed copies of the new edition were made available to Grade 6 teachers first (P. Xie, personal communication, March 19, 2024). Each sentence in the *Mandarin Matrix* textbooks currently being used was coded (as YES or NO) per the six aspects below (and subsumed in the first four research questions listed above):

a. The words used in the sentence represent native-Chinese speakers' usage in real-life communication.

b. The word order in the sentence presents native-Chinese speakers' usage in real-life communication.

c. The situation related to each sentence represents native-Chinese speakers' real-life communication.

d. The illustration portrays a genuine scenario reflecting common experiences of native-Chinese speakers (representing Chinese culture)

e. The settings (housing style, living environments, and decorations) depicted in the illustration reflect perspectives of native-Chinese speakers and shaped by Chinese culture.

f. The human characters in the illustration demonstrate behaviors of native-Chinese speakers conveying messages in real-life communicative contexts.

This analysis of linguistic and cultural authenticity sought to understand how the content and images in the *Mandarin Matrix* textbooks represent the target (Chinese) culture (Brown & Edouard, 2017). Linguistic authenticity was examined through aspects a, b, and c, and cultural authenticity was examined through aspects d, e, and f as noted above. Analysis of images was coded page by page within K-6 *Mandarin Matrix* texts (foundational through intermediate levels) that have been used for kindergarten through elementary school with DLI students since 2015 (Utah Dual Language Immersion, 2021).

Each grade uses several leveled booklets or books as shown in Table. 3.1.

Table 3.1

Levels of Mandarin Matrix Textbooks from K-6

Textbook level	Grade level	Units	Amounts
Foundation	K-1	10	20 booklets and 2 big books
Novice Low	Grade 2	10	30 booklets
Novice-Mid	Grade 3	10	30 booklets
Novice Mid	Grade 4	10	30 booklets
Intermediate Low	Grade 5	10	10 books
Intermediate Mid	Grade 6	8	8 books
Total	K-6	58	110 booklets and 20 books

Note. Adapted from Utah Dual Language Immersion (2018).

Teacher Survey

The design and content of the teacher survey was informed by previous relevant studies (Al-Musallam, 2009; S. Huang, 2018). Both Al-Musallam and S. Huang's studies provide critical elements that help to elicit teachers' perceptions of the extent of authenticity within *Mandarin Matrix*'s texts. These scholars highlighted the significance of text authenticity for literacy proficiency, particularly for reading and writing. Additionally, statements regarding the degree to which *Mandarin Matrix*'s texts support students' real-world language acquisition and cultural understanding were adapted from Al-Musallam's study. These elements were incorporated into the teacher survey to capture teachers' insights into the authenticity of the *Mandarin Matrix*'s texts.

The survey was administered to solicit Utah K-6 DLI Chinese teachers' perceptions about the *Mandarin Matrix* textbooks. It consisted of 23 questions divided into two parts following the demographic questions. First, teachers were asked to indicate

their opinions by responding to nineteen 5-point Likert-scale (from 1 to 5) items focused on the *Mandarin Matrix* texts, pictures, and content. Items asked teachers to express their views by rating 1 to 5 (1 indicates LEAST agreement, 5 indicates STRONGEST agreement) regarding how they believe this curriculum cultivates students' pragmatic usage of Chinese.

Second, four open-response items asked for teachers' instructional perceptions. The first item invited teachers to declare the frequency of their use of the *Mandarin Matrix* books in the classroom. The second and third items asked the teachers to share their views about the advantages and then limitations of the *Mandarin Matrix* curriculum in helping Chinese DLI students acquire Chinese. The fourth item invited teachers to share their experiences about integrating different tasks and activities with the *Mandarin Matrix* texts to enhance students' language skills and communicative competence. The survey items, presented in English (Johnson & Christensen, 2017), were reviewed and revised by scholars with language teaching experience (Krosnick, 1999), whose input was incorporated into the final version. The finalized survey can be found in Appendix A.

Participants

With approval from the Institutional Review Board at Utah State University and the Utah Chinese DLI Director, the teacher participants were recruited from Utah elementary schools that implement Chinese DLI programs. Recruitment flyers were distributed via social media, emails, and word of mouth. Teachers who were teaching or have previously taught in Chinese DLI programs were included. Despite offering early to help with recruitment, the Utah Chinese DLI Director was unable to disclose teachers'

email addresses for this study because the Utah State Board of Education did not grant its permission. Consequently, the pool of teachers was reduced to those who could be identified and recruited via other means.

The teacher survey was delivered via an online tool (Qualtrics) through the Utah State University portal. Prior to accessing the survey via the online link, teachers were informed regarding the potential risks and benefits associated with their participation. All teacher participation was voluntary. Teachers who were willing to participate were directed to an accompanying consent form and requested to read and sign it before commencing the survey.

To encourage participation, a modest incentive was offered. Each participant was eligible to be entered in an Amazon gift card drawing. When accepting this offer, participants were asked to provide an email address at the end of the survey on a separate page, indicating their agreement to allow the researchers to contact them for the purpose of emailing the gift cards. A random drawing was conducted using a computer. Teachers' email addresses were recorded on an Excel spreadsheet in order of their completion of the survey via USU's Qualtrics. For the drawing, the researcher utilized the RAND function embedded in the formula tab in Excel. Once five teachers were randomly selected by the function in Excel, gift cards were emailed to these teachers. The participants' email information remained confidential and completely separated from any association with the survey data. After the study, all email addresses were securely destroyed.

Data Coding Procedures

To commence the data coding procedure of K-6 textbooks content, the researcher calculated the frequency of basic components within the textbooks including units, pages, focus words, grammar patterns, and stories for each grade-level book. After calculating the frequency of these basic features of textbooks, word, word order, situations (represents native-Chinese speakers' real-life communication), and illustrations were examined. The steps are noted in Table. 3.2

Table 3.2

Steps of Content Data Analysis

Steps	Types of data to be analyzed	Methods
1	• Topics	• List topics for each grade-level book • Record themes emerging from the topics noted in *Mandarin Matrix's* resources • Record the thematic categorization across K-6 books
2	• Themes • Pages • Focus words • Grammar patterns • Stories	• List thematic categorization (Appendix B) • Summarize pages, focus words, grammar patterns, and stories into a table
3	• Word • Word order	• Code word used and word order in a sentence as representing linguistic authenticity or not (YES or NO)
4	• Representation of contexts	• Code situations related to each sentence as representing native-Chinese speakers' real-life communication or not (YES or NO)
5	• Images/Illustrations	• Code illustration as a genuine scenario reflecting common experiences of native-Chinese speakers (representing Chinese culture) (YES or NO) • Code setting (housing style, living environments, and decorations) depicted in the illustration as reflecting the perspectives of native-Chinese speakers and shaped by Chinese culture (YES or NO) • Code human character(s) in an image as demonstrating behaviors of Chinese natives conveying messages of real-life communicative contexts. (YES or NO)

Analytical Process for Categorizing Content

The thematic categorization of textbook topics and stories evidenced various and multiple themes. For instance, in a Grade 3 book, the story *At Grandparents' House* was categorized under the themes of family, hobbies and leisure, and home and neighborhood. Although liberal, this process condensed the data and identified units and meaningful patterns that might not be immediately apparent (Johnson & Christensen, 2017).

Second, the analysis tallied the number of pages, focus words, featured grammar patterns, and stories for each unit. The featured grammar patterns are listed by the program. Descriptive statistics for these calculations were summarized in a table. After these calculations, data were coded following a procedure to establish inter-rater reliability involving two coders (the researcher and a Chinese teacher). The co-coder, a native Chinese speaker, brought valuable expertise, having taught Chinese literacy and Chinese as a second language (CSL) to non-native Chinese speakers. The co-coder's academic background in CSL education equipped her with sufficient professional knowledge and perspectives to examine Chinese syntax and vocabulary.

Inter-Rater Reliability

To establish a reliable coding procedure, the researcher and the additional coder first engaged in parallel coding of randomly selected text (approximately 5% of the content), applying the six specified aspects (A-F) related to linguistic and cultural authenticity mentioned earlier. The coders performed a sentence-by-sentence analysis, allowing them to address any uncertainties or queries that arose. A codebook was

developed for the coding process. The codebook and the concepts of linguistic and cultural authenticity were reviewed with the co-coder. Once a clear understanding was established, the researcher and the co-coder proceeded to code three units from Grades K-1, Grade 3, and Grade 5 textbooks, while adhering to the six aspects (A-F) noted previously.

Upon achieving a stable and refined coding system, the two coders separately coded 10% of randomly selected texts and met to discuss findings and address disagreements (Gisev et al., 2013). Inter-rater reliability (IRR) for the co-coded selections was calculated using percentage agreement (Lim, 2012; Stemler, 2019). The target was to achieve an IRR exceeding 80%, which is considered an acceptable agreement. If the IRR for the selected content across the six specified aspects were to fall below 80%, the two coders would revisit the codebook and coding process to clarify the definition of the six aspects regarding authenticity. With this contingency, the two coders recoded two to three examples from the 10% of data together to ensure consensus. Afterward, separate coding was resumed for another 5% of the data to redetermine the reliability of coding.

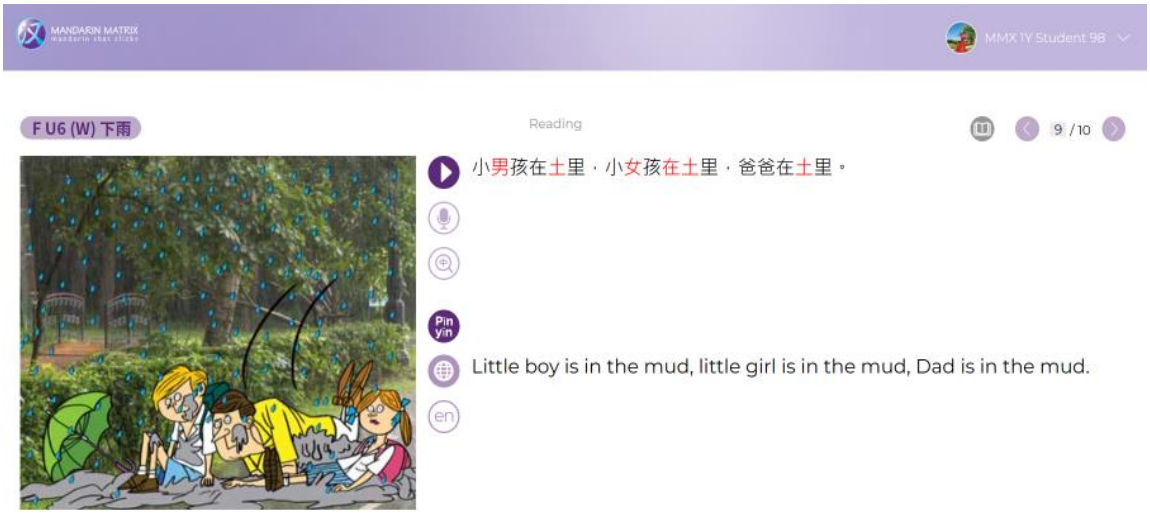
Once the IRR had been assessed and achieved the goal of >0.80 for all six aspects, the primary researcher proceeded to code the remaining data extracted from the K-6 textbooks. Following the completion of the coding procedures, analyzing the coded data was undertaken to identify patterns and trends. Through this analysis, the researcher developed an understanding of how the texts and images within the K-6 *Mandarin Matrix* textbooks represent authentic Chinese language and culture.

Coding Examples

The coding procedure focused on language use and cultural presentation from kindergarten to Grade 6 textbooks. For example, a sentence extracted from one of Grade 1 textbooks: 小男孩在土里, 小女孩在土里, 爸爸在土里 (Trans., Little boy is in the mud, little girl is in the mud; Dad is in the mud) is shown in Figure 3.1. This sentence could be coded "YES" for several aspects: it presents the word order of native-Chinese speakers' usage (Aspect b); the illustration portrays a scenario reflecting a possible experience of native-Chinese speakers (Aspect d); the setting (outdoor) depicted in the illustration reflects the perspectives of native-Chinese speakers and is shaped by Chinese culture (Aspect e); and the human characters in the illustrations demonstrate behaviors of Chinese natives conveying messages according to real-life communicative contexts (Aspect f).

Figure 3.1

Examples of Mandarin Matrix Texts and Images



However, the use of "土里 (in the mud)" in the sentences is less appropriate, as it carries a potential interpretation of someone deceased and interred in the earth. This is considered sensitive among Chinese people as it implies someone's demise and burial. Such connotations are deemed taboo within Chinese culture, leading individuals to avoid this expression in daily interactions. Replacing "里 (inside)" with "上 (on top)" would provide a more suitable alternative. Therefore, the sentences were coded "NO" for presenting native-Chinese speakers' words used in real-life communication (aspect A) and the situation related to each sentence represents Chinese native speakers' real-life communication (aspect C).

Another example extracted from one Grade 3 textbook is written, 这都是中国人爱吃的东西，来，你坐这边，我们一起吃 (Trans., These are all things that Chinese people love to eat. Come, you sit here, let's eat together; see the illustrations and language in Figure 3.2). This sentence can be coded "Yes" for all the abovementioned aspects. It…

a. presents native-Chinese speakers' words used in real-life communication;
b. presents the word order of native-Chinese speakers' usage in real-life communication;
c. include a situation that represents Chinese culture per native-Chinese speaker's real-life communication;
d. represents a scenario reflecting Chinese culture and the common experiences of native-Chinese speakers;
e. shows a setting (the food display and decoration) reflecting the perspectives of native-Chinese speakers, shaped by Chinese culture; and
f. include human characters in illustrations demonstrating behaviors of native-Chinese speakers conveying messages according to real-life communicative contexts.

Figure 3.2

Additional Examples of Mandarin Matrix Texts and Images

As shown in Figure 3.2, several elements are presented. In the illustration, there is a gold word (福, fortune) on red paper, which represents native-Chinese speakers' usage in real life. This kind of decoration is typical for a Chinese family to show their desire to have good fortune brought into the house. Additionally, the hanging decoration and the bamboo streamer represent Chinese food culture, allowing the viewer to associate with this specific cultural practice (Kramsch, 1998; Moss et al., 2015). In addition, the woman's hand shows her invitation to the guest to sit with them, reflecting hospitality to guests and the intention of communicating with the guest.

Translations of Chinese Sentences

To facilitate the coding process, each textbook sentence was recorded in Chinese in a spreadsheet. An English translation directly extracted from the *Mandarin Matrix* online platform was noted next to each Chinese sentence. The purpose of providing an

English translation was to help readers who know little about Chinese understand the meaning of each sentence. However, English translations of the content in some Grade 5 textbooks were not available on the *Mandarin Matrix* online platform. To remain consistent in providing English translations for sentences in the Grade 5 textbook, translations were initially generated using an online translator. Subsequently, the researcher confirmed the accuracy of translations in consultation with another Chinese DLI teacher, who is fluent in Chinese and English and familiar with language translation. An agreement was sought to give an English translation that best captures the meaning of the Chinese content.

Data Analyses

As mentioned earlier, the data analysis process that involved calculation of the numbers of units, pages, focus words, grammar patterns, and stories was summarized in a table. In addition, tallies obtained from a coding process conducted for each sentence and image in every lesson of the K-6 textbooks yielded the percentage of language coded per six aspects (A-F). This process helped determine the extent of linguistic and cultural authenticity for each grade-level textbook targeted in Research Questions 1 and 2. The results of frequencies and percentages across grade-level textbooks were tabulated in tables. A comparison was conducted to understand whether linguistic or cultural authenticity is more evident and how such authenticity varies by grade level. This analysis indicated whether the *Mandarin Matrix* textbooks evidence progressively more linguistic and cultural authenticity from kindergarten to Grade 6 as targeted in Research

Question 3.

Teacher Survey Responses

Teachers' demographic data were used to characterize the teacher sample. Teacher participants' ratings for survey items using the Likert scale were exported to an Excel file for analysis, including calculating the mean, range, and standard deviation for each item. The metrics for participants' ratings for each survey item indicated the responding teachers' perceptions of the *Mandarin Matrix* textbooks. A summary of teachers' responses was generated. Responses to open-ended questions were also recorded in another Excel file for open coding and categorization. The coded responses were generated to identify themes emerging from teachers' written responses (Saldaña, 2016). To ensure the credibility of the categorizing process, a researcher with expertise in qualitative and quantitative analyses reviewed the categories to ensure they are mutually exclusive and collectively exhaustive, enhancing the validity and reliability of the findings (Creswell & Poth, 2016).

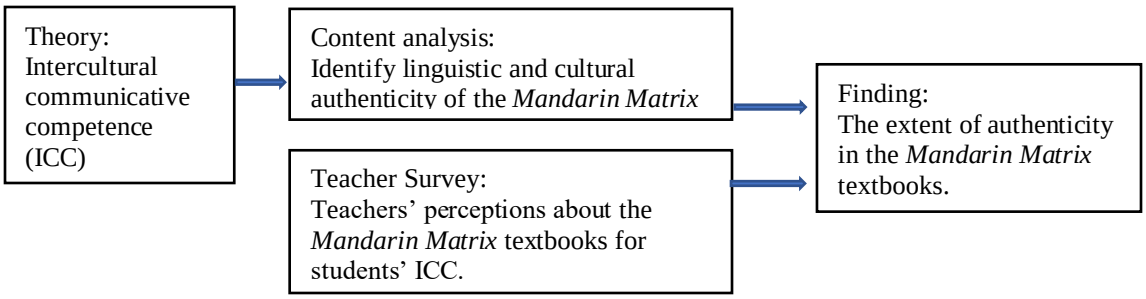
The teacher responses were then compared to the results of the content analysis findings to assess whether and how the *Mandarin Matrix* textbooks reveal a progression of authenticity in content (see Figure 3.3). Results of the content analysis and teachers' responses to the survey were integrated to provide a fuller interpretation of the data.

Conclusion of the Methodologies

The methodologies for this study aimed to investigate the level of linguistic and cultural authenticity evident in the Utah Chinese DLI literacy curriculum, specifically the

Figure 3.3

Model of Data Analyses



kindergarten to Grade 6 *Mandarin Matrix* textbooks. Research questions seeking to assess linguistic and cultural authenticity as manifested in the content and illustrations guided the content analysis and teacher survey items. The findings inform developers of Utah's Chinese literacy curriculum, with suggestions for crafting more authentic content that can foster students' language development and ICC. Additionally, the findings derived from analyses might aid teachers in contemplating the augmentation of authentic language exposure and possible need for supplementary materials to enrich students' engagement with Chinese language and culture. Ultimately, this research endeavor sought to contribute to the continuous improvement of the Chinese literacy curriculum for students within Utah's DLI program.

CHAPTER 4

RESULTS

This study utilized content analysis to assess the extent of linguistic and cultural authenticity of *Mandarin Matrix* across Grades K-6 textbooks. Linguistic authenticity was examined on a sentence-by-sentence basis, focusing on three categories: choice of words, sentence structure, and situations referenced therein to determine those representing real-life aspects of native-Chinese speakers' communication. Second language (L2) pragmatic competence is associated with learners' understanding of the linguistic conventions and social norms of native speakers (Culpeper et al., 2018; Roever, 2021; J. Thomas, 1983). In fact, Roever highlighted that pragmalinguistic competence is essential, as it equips users with the necessary knowledge to effectively engage in realistic language functions such as making requests or suggestions. Thus, in this study, the examination of cultural authenticity was conducted through the analysis of each illustration. This analysis emphasized three categories: determining scenarios that reflect Chinese culture, settings including housing style, living environments, and decorations that reflect Chinese culture, and whether the human characters included therein embody behaviors typical of Chinese cultural natives. These six categories used as part of the coding process are shown in Table 4.1. Trained coders employed a quantitative approach to calculate the frequency of instances per category, providing a systematic evaluation of linguistic and cultural authenticity as defined for this study.

To augment the content analysis portion, a teacher survey solicited users' perceptions of the *Mandarin Matrix* materials. Among roughly 160 Chinese DLI teachers

Table 4.1

Coding Categories for Linguistic and Cultural Authenticity

	Linguistic authenticity of sentences			Cultural authenticity of illustrations		
	Word used	Word order	Situation	Scenario	Setting	Human characters
Coding Categories	The words used in the sentence represent native-Chinese speakers' usage in real-life communication (Y/N)	The word order in the sentence represents native-Chinese speakers' usage in real-life communication. (Y/N)	The situation related to each sentence represents native-Chinese speakers' real-life communication. (Y/N)	The illustration portrays a genuine scenario reflecting common experiences of native-Chinese speakers (representing Chinese culture) (Y/N)	The settings (housing style, living environments, and decorations) depicted in the illustration reflect perspectives of native-Chinese speakers and shaped by Chinese culture. (Y/N)	The human characters in the illustration demonstrate behaviors of native-Chinese speakers conveying messages in real-life communicative contexts. (Y/N)

in Utah, 40 educators (25%) teaching Grades 1 to 6 participated in the survey, expressing their opinions via 19 Likert-scaled questions and four open-ended questions. The survey provided valuable qualitative insights into teachers' views of the *Mandarin Matrix* materials.

General Description of the Mandarin Matrix Curriculum

As noted in the previous chapter, the *Mandarin Matrix* curriculum serves as a critical resource for Utah Chinese DLI students. The materials have been published by *Mandarin Matrix Limited* in Hong Kong since 2015 and were adopted for the Utah Chinese DLI program in 2016 under the direction of the USBE Director of DLI Chinese programs. However, the publication dates for different grade-level books were progressive, starting in 2015 and continuing to 2021. Table 4.2 presents the publication year(s) for each grade-level set.

Table 4.2

Publication Years for Grades K-6 Mandarin Matrix Books

Books for grades	Publication years
Grades K-1 books	2015
Grade 2 books	2015
Grade 3 books (Units 1-5)	2015
Grade 3 books (Units 6-10)	2016
Grade 4 books	2016
Grade 5 books	2018
Grade 6 books (Older version)	2019
Grade 6 books (Newer version)	2021

Note. Adapted from *Mandarin Matrix Limited.*

Specifically tailored for Grades K to 8 Chinese DLI students, the *Mandarin Matrix* curriculum entails an extensive series of textbooks spanning foundational and novice stages through the intermediate levels. Books designed for students in Grades K-5 consist of 30 lessons (stories) at each grade level, and Grade 6 books (newer version) include 24 lessons (stories). Each unit in Grades K-4 books features three 10-page stories. While each story is presented as a book in Grades K-4, Grades 5 and 6 books combine three stories into one book. Stories in the Grade 5 books range from 34 to 42 pages, and stories in Grade 6 range from 50 to 69 pages. Figures 4.1 and 4.2 depict the appearance of the pages in the Grades 5 and 6 books, respectively. The number of focus words, as well as grammar patterns per lesson, increases across K-6 textbooks. The grammar patterns as identified by *Mandarin Matrix* pertain to syntactic structures found within stories. For instance, the construction of "verb +来+verb +去" shows the word order used to express the repetition of an action. A summary of units, focus words, grammar patterns, stories, and pages is presented in Table 4.3.

Figure 4.1

An Example of Grade 5 Books

Figure 4.2

An Example of Grade 6 Books

Table 4.3

Descriptions of Mandarin Matrix Textbooks from Grades K-6

Textbook level	Grade	Units	Focus words	Grammar patterns	Numbers of stories	Mean pages per story	Total pages per grade level
Foundation	K-1	10	47	19	30	10	300
Novice Low	Grade 2	10	62	20	30	10	300
Novice Mid	Grade 3	10	79	24	30	10	300
Novice High	Grade 4	10	85	26	30	10	300
Intermediate Low	Grade 5	10	116	30	30	13	380
Intermediate Mid	Grade 6	10	149	33	24	19	466
Total	K-6	60	538	152	174	72	2,046

Note. Adapted from *Mandarin Matrix* (2023c, 2023d, 2023e, 2023f, 2023g, 2023h).

The *Mandarin Matrix* curriculum includes a thematic categorization of textbook topics. As expected, the stories therein address various themes, beginning with numbers and dates and focusing on family, neighborhoods, animals and hobbies, and leisure. For example, the Grades K-1 story “Number Race” falls into thematic categories including Chinese foundation (introducing simple characters like 一, 二, 三), numbers and dates,

and school life. Interestingly, Grade 5 literature emphasizes school settings more prominently compared to lower grade levels. By Grade 6, the themes are less home-centric, with topics such as culture and customs and cultural experiences Appendix B presents the evolution of themes throughout K-6 books.

Features of Foundational-Level Textbooks

Texts for the foundational level are tailored for beginners and, in Utah, are utilized by Chinese DLI students in Grades K and 1. In several Utah school districts, the Chinese DLI program starts at kindergarten. However, in most districts, the program begins in first grade (Asia Society, 20248). The book sets at this level feature a minimal number of Chinese characters on a page, with some pages containing only single characters such as 上(up), 下(down), 大(big), or 小(little). Additionally, the illustrations in these books feature anthropomorphic animal characters engaging in communication.

Features of Novice-Level Textbooks

The novice level of books comprises three sublevels aligned with the language proficiency levels defined by the American Council on the Teaching of Foreign Languages (*Mandarin Matrix*, 2023b): novice low, novice mid, and novice high. In Utah, the novice-low (Novice 1) level of books is designated for Grade 2 Chinese DLI students. This set of books features a limited number of Chinese characters, but the texts feature basic sentences on each page. These sentences showcase essential communicative language, such as greetings, indicating intention, or giving instructions, compared to the foundational level of books. The illustrations in this set of books resemble those found at

the foundational level, with certain books featuring animal characters anthropomorphically engaged in communication.

In Utah's Chinese DLI programs, Grade 3 students utilize the novice-mid (Novice 2) level of books, while Grade 4 students engage with the novice-high (Novice 3) level of books. These books are distinctive in that they incorporate pictures in rebus fashion (creating visual representations of words or phrases using pictures or symbols) to depict certain vocabulary that would likely pose challenges for students. Examples of such vocabulary include words such as 沙堡 (sand castle), 贝壳 (shells), or 爆米花 (popcorn). Some components in these characters (i.e., 沙堡, 贝壳, 爆, 米) may not be commonly encountered in textbooks, adding to the difficulty for students. Moreover, the compound words of 沙堡 (sandcastle) and 爆米花 (popcorn) present challenges to students due to the complexity of certain characters (such as 堡 and 爆), making them challenging to memorize. However, characters such as 沙 (sand) and 米 (rice) are introduced in Grade 5 books, indicating that the recognition and understanding of these characters are eventually developed within the curriculum. This progression suggests that while certain words may initially be challenging, students' familiarity with individual characters should grow over time, aiding in their comprehension and retention of more characters learned previously.

Features of Intermediate-Level Textbooks

The intermediate-level texts encompass three sublevels that are aligned with the language proficiency levels defined by the American Council on the Teaching of Foreign

Languages (*Mandarin Matrix*, 2023b): intermediate low, intermediate mid, and intermediate high. Specifically designed for Grades 5 to 8 students participating in the Utah Chinese DLI program, these books are categorized as Intermediate 1 to Intermediate 4, corresponding to the four intermediate grade levels. In the materials crafted for students in Grades 5 and 6, there are more extensively written passages, with a deliberate reduction of visual elements compared to the textbooks tailored for Grades 1-4. Table 4.4 provides details on the language proficiency levels, associated grade levels, and the corresponding book levels.

Table 4.4

Levels of Mandarin Matrix Textbooks and Grades K-8 Correspondences

Language proficiency level	Grade level	Book level
Foundational Level	Grades K-1	Foundation
Novice Low	Grade 2	Novice 1
Novice Mid	Grade 3	Novice 2
Novice High	Grade 4	Novice 3
Intermediate Low	Grade 5	Intermediate 1
Intermediate Mid	Grades 6 and 7	Intermediate 2 and Intermediate 3
Intermediate High	Grade 8	Intermediate 4

Note. The resource is from Utah Dual Language Immersion (2018).

Research Questions

This study of the *Mandarin Matrix* curriculum materials was guided by four research questions. The subsequent exploration aimed to provide a comprehensive understanding of linguistic and cultural authenticity of the *Mandarin Matrix* textbooks, as well as to examine Utah Chinese DLI teachers' perceptions of the program.

1. How linguistically authentic (to native Chinese) is the linguistic content of the *Mandarin Matrix* K-6 textbooks?
    a. How authentic (to native Chinese) is the word-level content of the *Mandarin Matrix* K-6 textbooks?
    b. How authentic (to native Chinese) is the sentence-level content of the *Mandarin Matrix* K-6 textbooks?
2. How culturally authentic (to native Chinese cultures) are the *Mandarin Matrix* K-6 textbooks?
    a. How culturally authentic are the communicative messages of the characters in the *Mandarin Matrix* K-6 textbooks?
    b. How culturally authentic are settings presented in the *Mandarin Matrix* K-6 textbooks?
    c. How culturally authentic are the behaviors of the characters used in the *Mandarin Matrix* K-6 textbooks?
3. Do the *Mandarin Matrix* textbooks increase in linguistic and cultural authenticity across the K-6 grade levels?
4. What are the perceptions of K-6 Utah Chinese DLI teachers using the *Mandarin Matrix* textbooks for Chinese teaching and learning?

Data Collection Methodology

Data collection included the coding of textbook content and a teacher survey with analyses of these portions occurring sequentially. To facilitate the coding of textbook content, as the researcher, an Excel spreadsheet was prepared with column headings for grade levels, language proficiency levels, titles, topics, Chinese sentences, English translations, and the above-mentioned six categories targeting authenticity. In addition, corresponding illustrations were attached before the columns of categories for analyzing illustrations.

Development of Codebook

Before establishing the coding process with another coder, a codebook was prepared to serve as a reference guide for the coding process and to promote inter-rater reliability. The codebook included guidelines that assisted coders in identifying issues related to word usage, sentence structure, and situations that did or did not reflect real-life communication of native-Chinese speakers. The codebook also provided guidelines for coding any accompanying illustration. Coders followed these guidelines to evaluate whether scenarios, settings, and human character behaviors were deemed to align with authentic aspects of Chinese language and accurately reflect common experiences among native-Chinese speakers.

Summary of Coding Process

To increase the trustworthiness of the content analysis, two coders (the researcher and a Chinese teacher) worked to establish reliability. The coding process commenced with a training session, during which both coders used the codebook to collaboratively code 5% of the data randomly selected from Grades 1, 3, and 5 textbooks (a total of nine books). Throughout the training session, discussions helped to address any issues encountered and update the codebook to establish clear criteria for coding words and illustrations.

Initial Independent Coding of Grades 3 and 4 Textbooks

After the training session and refinement of the codebook, coders proceeded to

independently code another 5% of the data, encompassing another nine books from Grades 3 and 4 textbooks. These two levels of textbooks are the only books that incorporate (rebus formatted) pictures within written discourse to illustrate challenging vocabulary. Thus, establishing reliability for coding this special format was unique. Upon completion of individual coding, codes were compared. This process resulted in generally high agreement with at least 86% across the six categories: word selection (94.84%), sentence structure (100%), situations presented in sentences (100%), circumstances or scenarios (100%), settings (86.36%), and behaviors of human characters (100%).

In this phase, disagreements mainly revolved around word usage and the absence of a word in a sentence. For example, the co-coder advocated for needing one or more specific characters to enhance message clarity, while the researcher believed it was unnecessary. For example, 如果下雨, 我们就可以在里面吃吃水果、看看书，还可以跟小羊玩一玩 (Trans., If it rains, we could enjoy fruit, read books, and play with little sheep inside). The co-coder suggested adding one character in between 吃吃, making it 吃一吃, while the researcher considered there was no difference in meaning for trying a small portion of food by using either 吃吃 or 吃一吃. The co-coder also contended that 吃一吃 might imply meaning to “have a taste” which might not be suitable for the context of the original sentence within the picnic scenarios. The original sentence does not suggest trying a new dish or encouraging someone to experience food in an introductory way. Therefore, consensus was achieved by evaluating whether adding or removing specific Chinese characters contributed to a clearer meaning versus introducing complexity that could lead to confusion.

Some disagreement also arose during the coding of illustrated settings, with difficulty in designating indoor settings when the illustrations only depicted corners or small spaces of a house. Similar challenges were also evident in coding illustrations of outdoor environments. However, via discussion, it was determined that criteria for coding settings be based on whether the illustration predominantly depicts life experiences reflecting native Chinese people's living styles or not. This discussion played a crucial role in enhancing the coders' inter-rater reliability in the next step—independently coding Grades 1 and 2 textbooks.

Second Independent Coding of Grades 1 and 2 Textbooks

Despite initially achieving over 86% consensus on the independently coded data, the co-coders collaboratively addressed and resolved any remaining disagreements. Following this discussion, they moved forward to code the third 5% of the content, encompassing nine more books from Grades 1 and 2 textbooks. These textbooks are unique within the K-6 series as they exclusively include illustrations depicting animal characters anthropomorphically communicating in Chinese. Coding the textbooks posed a challenge in determining whether the animals authentically personified human characters' behaviors and within human scenarios. Building reliability for these specific grades enabled the researcher to establish a consistent coding system for the remaining Grades 1 and 2 textbooks. After individually completing this coding procedure, 88% agreement was achieved across the six specified categories examining linguistic and cultural authenticity. Compared to the initial 5% of the data coded independently, which

included Grades 3 and 4 textbooks, the inter-rater reliability improved in two categories: word usage (i.e., the linguistic authenticity of vocabulary) and the settings (i.e., the cultural authenticity of illustrations). The inter-rater reliability for word usage in Grades 3 and 4 textbooks was 94.84% and 95.38% in Grades 1 and 2 textbooks. For coded settings, reliability was 86.36% for Grade 3 and 4 textbooks and 88.88% for Grade 1 and 2 textbooks. The remaining four categories achieved 100% reliability for both Grades 3 and 4 and Grades 1 and 2 coding processes.

The lower inter-rater reliability when coding settings was influenced by factors including ambiguous illustrations, subjective interpretations of indoor or outdoor scenes, and varying perspectives on different settings. Accordingly, specific challenges encountered during the coding process related to these few discrepancies were reviewed to improve consistency.

Final Independent Coding Phase: Grades 5 and 6 Textbooks Data

With increased understanding of the coding process and challenging textual content, the coders moved on to code the fourth and the final 5% of the data, the Grades 5 and 6 textbooks. In these textbooks, there is a predominance of longer texts incorporating fewer illustrations than for Grades 1 to 4 stories. This posed a challenge to ensure accurate coding of the increased complexity of linguistic content. Despite the challenge, this coding process achieved over 96% agreement across the six specified categories examining linguistic and cultural authenticity for Grades 5 and 6 textbooks. Moreover, the inter-rater reliability improved from the initial and second independent coding phase

for word usage and settings of illustrations, which focused on Grades 3 and 4 then Grades 1 and 2 textbooks. The inter-rater reliability for coding of settings showed improvement because the illustrations within Grades 5 and 6 textbooks feature fewer and less ambiguous scenes.

During coding of Grades 5 and 6 books, a few disagreements occurred with certain texts where the co-coder believed that adding one or a couple of words to a sentence would convey a clearer meaning. This challenge pertained to syntactic concerns, even though it might initially seem like a word-usage problem. For example, consider the following sentence from a Grade 5 textbook: 如果我们看见熊的话，要小心，不能怕 (Trans., If we do see a bear, be careful and don't be afraid). One coder suggested that the "不能怕" should be replaced with "不要怕," altering the middle character from the original phrase. Both expressions convey the idea of "don't be afraid," but with subtle differences. The literal meaning of "不能怕" expresses "must not be afraid," implying a sense of obligation of "not being afraid." This suggests that "being afraid" might not be permissible. On the other hand, "不要怕" (don't want or need to be afraid) is a more straightforward and encouraging way to express "don't be afraid" without emphasizing a sense of obligation. Regarding this specific disagreement, coders concluded that examining the English translation and the context provided by the texts would be the criteria for deciding the appropriateness of word usage. In this case, both "不能怕" and "不要怕" were suitable for the context, and both conveyed the meaning of "don't be afraid." Therefore, it could be coded as having authentic word order.

In total, the co-coded data comprised 20% of the texts randomly selected from

textbooks spanning Grades K to 6. The collaboration between the coders, along with their resolution of disagreements, paved the way for a more consistent analysis of the content, resulting in high reliability. The detailed results for the inter-rater reliability across the six coded elements are presented in Table 4.5. With the establishment of sufficient inter-rater reliability for each item and a more nuanced understanding of possible issues, the researcher proceeded to code the remaining texts.

Results of Analysis of Linguistic Authenticity

The assessment of linguistic authenticity involved analyzing word usage, word order, and situational relevance for each sentence. The researcher initially tallied the occurrences of "YES" as confirmations per category for each book, followed by aggregating the results for each grade level. The following sections provide a detailed breakdown of the frequency for each category and then explain the results. This meticulous examination aimed to gauge the authenticity of the language evident in the *Mandarin Matrix* textbooks across different grade levels.

Authenticity of Word Selection

The word selection results for Grades K-6 stories demonstrated authenticity above 90%, indicating that the words employed in the *Mandarin Matrix* textbooks from Grades K-6 accurately represent the daily communication of native-Chinese speakers. Detailed results are presented in Table 4.6, illustrating the frequencies and percentages of word selection in textbooks across these grades.

Table 4.5

Inter-Rater Reliabilities (IRRs) for the Initial, Second, and Third 5% Independent Coding Phases

	Linguistic authenticity of sentences			Cultural authenticity of illustrations		
	Word used	Word order	Situation	Scenario	Setting	Human characters
Coding categories	The words used in the sentence represent native-Chinese speakers' usage in real-life communication (Y/N)	The word order in the sentence represents native-Chinese speakers' usage in real-life communication. (Y/N)	The situation related to each sentence represents native-Chinese speakers' real-life communication. (Y/N)	The illustration portrays a genuine scenario reflecting common experiences of native-Chinese speakers (representing Chinese culture) (Y/N)	The settings (housing style, living environments, and decorations) depicted in the illustration reflect perspectives of native-Chinese speakers and shaped by Chinese culture. (Y/N)	The human characters in the illustration demonstrate behaviors of native-Chinese speakers conveying messages in real-life communicative contexts. (Y/N)
Grades 3 and 4 books	94.84%	100%	100%	100%	86.36%	100%
Grades 1 and 2 books	95.38%	100%	100%	100%	88.88%	100%
Grades 5 and 6 books	96.74%	100%	100%	100%	96.29%	100%
Mean scores	95.65%	100%	100%	100%	90.51%	100%

Table 4.6

Frequencies and Percentages of Word Selection Deemed Authentic in Grades K-6 Textbooks

Grade	Grades K-1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
Frequencies	396/438	652/708	830/908	711/763	1041/1106	1267/1277
Percentages	90.41%	92.09%	91.40%	93.18%	94.12%	99.21%

Additionally, the differences and increments between each grade show a progression from Grade K to Grade 3 books and from Grade 5 to Grade 6 books. The increment from Grade 5 to Grade 6 books is 5% greater, with 99.21% authenticity found in 1,277 sentences within Grade 6 books. This outcome is particularly noteworthy when compared to Grades K-1 books, which were deemed 90.41% authenticity across 438 sentences. The authenticity of words in Grade 6 books achieved a score of nearly 100%, suggesting that the *Mandarin Matrix* textbooks designated for Grade 6 students contain few words that native-Chinese speakers might not commonly employ in real-life conversations. Nevertheless, the authenticity in Grade 3 books indicates a slight decrease from Grade 2 books, dropping from 92.09% to 91.40%. This decrease in authenticity may be attributed to the texts comprising more varied vocabulary compared to Grade 2 books. Moreover, some sentences are simplified by omitting words, rendering a degree of incompleteness, which could contrast with real-life usage to accommodate students' language proficiency levels.

There is a decrease in the number of sentences from Grade 3 to Grade 4 textbooks. This doesn't necessarily imply a decrease in the length of sentences. For instance, Grade 4 books begin to incorporate connecting words such as 可是 (but) and 然

后 (and then) within sentences. These coordinating conjunctions lengthen sentences and pose a challenge for students' reading comprehension, as they may not have encountered these words in lower-grade texts.

Authenticity of Sentence Structure

The sentence structure coding results for Grades K-6 indicated consistently high percentages of reliability, with each grade-level set achieving scores ranging from 99.11% to 100%. Detailed results are presented in Table 4.7, illustrating the frequencies and high percentages of authentic sentence structure in textbooks across these grades.

Table 4.7

Frequencies of and Percentages of Authentic Sentence Structure in Grades K-6 Textbooks

Grade	Grades K-1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
Frequencies	407/407	673/679	895/899	742/748	1086/1087	1277/1277
Percentages	100%	99.11%	99.55%	99.19%	99.90%	100%

The narrow range as shown above suggests that this set of textbooks is authentic in its syntax. While there were slight decreases observed from Grades K-4 books, the differences are negligible. It is noteworthy that the authenticity of sentence structure in textbooks for Grades K-1 and Grade 6 is 100%. These results may reflect various underlying factors. In the case of Grades K-1, the high authenticity score could be attributed to the simplicity and utilization of basic syntactic structures. Such texts are commonly tailored to meet the developmental needs of younger learners in language materials (Campos, 1991; Libert, 2013, 2016; Zyzik & Polio, 2017).

The high level of authenticity found in Grade 6 textbooks, featuring more sentences and complex structures, suggests they are designed to equip students with the linguistic skills necessary for practical language tasks. Unlike earlier grades, the Grade 6 textbooks include more expressions across diverse contexts. Therefore, the presence of authentic content likely reflects a purpose to advance students' linguistic abilities, preparing them for higher-grade challenges and real-world communication.

Linguistic Authenticity Aligned with Common Language Use

The representation of context-based language in sentences across the *Mandarin Matrix* textbooks (Grades K-6) was consistently deemed authentic, with ratings ranging from 97.33% to 100%. This indicates that the coders evaluated the linguistic contexts as being authentic to how native-Chinese speakers would use language in similar situations. For example, consider this sentence from a Grade 3 book: 很高兴你能来我家玩，快进来吧! (Trans., I'm glad you could come to my house. Come in!). This sentence reflects the hospitality of Chinese people when welcoming a guest. While the phrase "快进来吧!" (Come in quickly!) may convey a sense of command, it also highlights the eagerness and warmth inherent in Chinese cultural norms of hospitality. Detailed results are provided in Table 4.8, presenting the frequencies and percentages of authentic situations in textbooks across these grades.

The narrow range of percentages across grade levels suggests that this set of textbooks (K-6) consistently represents native-Chinese speakers' common communication. In Grades K-1 books, the authenticity rate is high at 98.58%. This high

Table 4.8

Frequencies and Percentages of Situations Deemed Authentic in Grades K-6 Textbooks

Grade	Grades K-1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
Frequencies	419/425	707/709	907/908	739/748	1058/1087	1277/1277
Percentages	98.58%	99.71%	99.88%	98.79%	97.33%	100%

level of authenticity is even slightly improved in Grade 2 books, reaching 99.71%. Grade 3 books exhibit a further increase in authenticity, with a rate of 99.88%.

However, there is a decline within Grades 3-5 books, possibly linked to Grades 4 and 5 books incorporating cross-cultural comparisons between Western and Chinese cultures. Western culture is more prominently integrated into the texts compared to Chinese culture. This integration is evident in references to holiday celebrations or life experiences, such as a trip to Canada or making pizza.

Notably, Grade 5 and Grade 6 books have frequencies of sentences of 1,087 and 1,277, respectively, with an impressive authenticity rate of 97.33% and 100%. Although a minor decrease in authenticity was observed in Grade 5 books, it can be considered negligible. Comparing Grade 5 with Grade 6 books, there's a notable increase of two percentage points, surpassing the differences observed between other grades. Grade 6 textbooks achieve a 100% authenticity rating, indicating a comprehensive embedding of Chinese cultural elements throughout the curriculum. The authenticity of situations depicted in Grade 6 content stems from the incorporation of substantial Chinese cultural elements, particularly emphasizing the theme of study groups in China across this set of books.

In a Grade 6 storyline, the study group embarks on a journey from the U.S. to

explore renowned historical sites and tourist attractions in China. Along the way, they immerse themselves in authentic local cuisine, conduct a simple survey about peoples' perspectives of on new Beijing and old Beijing, experience Chinese school life, and engage in comparisons between Chinese and American cultures. This storyline fosters a deeper understanding of cultural identity while showcasing the richness of native-Chinese peoples' communications. The Grade 6 books are updated versions, potentially featuring content edited for increased authenticity compared to older versions, thus explaining the heightened authenticity of the contextualized language therein.

Extent of Cultural Authenticity

The evaluation of cultural authenticity encompassed an analysis of scenarios, settings (i.e., housing style, living environments, and decorations), and the behaviors of human characters in each illustration. The researcher tallied the occurrences of "YES" for all illustrations in each book, followed by aggregating the results for each grade level. Subsequent sections present a detailed breakdown of the percentages of authenticity coded for each category. When accounting for repeated occurrences of the same setting in each story, the respective setting was coded once even if shown several times in a story. For example, the four illustrations (Figure 4.3) below depict the same setting, which was only coded once as YES. A determination stemmed from the home environment, food display, and wall decorations within the illustrations, reflecting the perspectives of native-Chinese speakers influenced by Chinese culture.

Figure 4.3

Examples of Illustrations of Settings in Grade 3 Books

Evaluation of Cultural Authenticity of Scenarios

The results for coding scenarios for Grades K-6 texts yielded ratings ranging from 92.42% to 98.76%, indicating that the scenarios demonstrate high levels of authenticity. The detailed results are shown in Table 4.9, presenting the frequencies and percentages of scenarios illustrated in textbooks across these grades.

Table 4.9

Frequencies of Scenarios and Levels of Authenticity Representing Chinese Culture in Grades K-6 Textbooks

Grade	Grades K-1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
Frequencies	305/330	327/330	314/330	305/330	190/198	239/242
Percentages	92.42%	99.09%	95.15%	92.42%	95.95%	98.76%

The number of illustrations in textbooks decreases from 330 in Grades K-1 books to 198 in Grade 5 books, then increases to 242 in Grade 6 books. One possible reason for offering more illustrations to lower-grade students is to support their comprehension as they read texts, given their novice language proficiency levels. In Grades K-4 books, the images are designed to correspond to 1-3 sentences. In contrast, images in Grades 5 and 6

books align with 2-10 sentences, with Grade 5 books incorporating fewer illustrations.

The authenticity percentages for scenarios range from 92.42% to 99.09%. There is an increase from Grades K-2 books, followed by a decline from Grade 2 books to Grades 3 and 4 books. Notably, Grade 2 book illustrations were deemed highly authentic, nearly reaching 100%. This could be attributed to the fact that this set of books predominantly focuses on school and family life, with minimal integration of Western-specific cultural practices. However, Grades 3 and 4 books begin to incorporate more Western cultural elements, particularly evident in holiday celebrations. While demonstrating high authenticity, there is a notable emphasis on American culture over Chinese culture in the two grade levels. This may stem from the *Mandarin Matrix* editors' approach of initially introducing students to familiar cultural elements before gradually integrating more aspects of Chinese culture.

Although the scenarios portrayed in textbooks for Grades K to 5 may not explicitly highlight Chinese cultural norms, they provide an accurate portrayal of the daily lives of Chinese people. For instance, consider the illustration (Figure 4.4) below, depicting a girl using chopsticks to eat dumplings. This scene and its surroundings reflect a common home environment and include daily behaviors of typical Chinese people.

Figure 4.4

An Example of Illustrations of Setting in Grade 4 Books

Analysis of Settings

In comparison with other categories, the percentages of authenticity for settings (i.e., housing style, living environments, and decorations) were the lowest of coded categories across Grades K-5 books. Grades K-1 and Grade 2 books were below 60%, with Grades 3 and 4 books falling below 50%. While Grade 5 books reached 60%, it is still relatively low when compared to Grade 6 books that is 97.77%. Detailed results of frequencies and percentages can be found in Table 4.10.

Table 4.10

Frequencies and Percentages of Authentic Settings Illustrated in Grades K-6 Textbooks

Grade	Grades K-1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
Frequencies	40/73	45/78	44/96	42/97	36/60	88/90
Percentages	54.79%	57.69%	45.83%	43.29%	60%	97.77%

The relatively low frequencies resulted from each book's settings being counted only once. Additionally, the low percentages of authentic settings, (i.e., house styles, surroundings, and decorations within the house) illustrated in Grades K-5 books, reflect dominant representation of Western or American culture. One reason that Grades 3 and 4 books reflect lower percentages of authentic settings than Grades K-1 and Grade 2 books can be attributed to this set of books, predominantly showcasing house style and decorations of American culture rather than Chinese culture. Grade 4 books yielded lower percentages than Grade 3 books because they feature more cultural aspects, particularly American holidays such as Halloween and Easter. However, the percentage of authentic settings increased by over 30% from Grade 4 to Grade 6 books, reflecting a significant jump from Grade 5 to Grade 6 books. This suggests that the newer Grade 6 *Mandarin Matrix* textbooks evident a shift in emphasis, introducing more Chinese culture. As noted previously, the stories in Grade 6 books center around the experiences of a study group tutoring in China. Therefore, the content places a significant emphasis on Chinese history, poems, monuments, and comparing Chinese and American culture.

Behaviors of Human Characters

In the portrayal of human characters, story characters were analyzed by their actions, gestures, and interactions with other characters in the illustrations. Their skin colors or other features indicating ethnicity were not accounted for in the coding process. This approach helped ensure that the analysis focused on observable behaviors rather than subjective interpretations of characters' appearances. The analysis of human characters' behaviors revealed a remarkably tight range of coded frequencies, with

percentages ranging narrowly between 98.78% and 100%. Further details can be found in Table 4.11.

Table 4.11

Frequencies and Percentages of Behaviors of Human Characters Illustrated in Grades K-6 Textbooks

Grade	Grades K-1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
Frequencies	250/253	318/319	329/330	326/330	198/198	242/242
Percentages	98.81%	99.68%	99.69%	98.78%	100%	100%

As noted, animals are portrayed in the illustrations in Grades K-1 textbooks. These depictions required coding the behaviors of these animals as personified actions, thereby determining if their behaviors align with those of human beings. Among the 30 books examined, six contain illustrations featuring animals, with one book depicting cubes playing in the playground. Additionally, in Grade 2 textbooks, there is one book that features a personified cloud depicting human characteristics. Still, the consistency of instances suggests that across Grades K to 6, this series of textbooks regularly portrays communication behaviors common of native-Chinese speakers.

One difference shown in Grade 5 textbooks is the consistent portrayal of human characters' behaviors, with all illustrations reflecting human actions. In Grade 6 books, this trend continues, with all depicted characters exhibiting human behaviors without any instances of animals or other non-human entities being anthropomorphized. This demonstrates a clear evolution in the representation of human communication behaviors across the elementary school curriculum, reflecting a more realistic array of human interactions as students advance through the grades.

As shown, the evaluation of the linguistic and cultural authenticity resulted in high percentages across grade levels. Thus, these texts were deemed as highly authentic with some variations by grade level. Notable variations include: (a) a slight decrease in linguistic authenticity in Grade 5 books followed by a significant increase in Grade 6 books; (b) Grade 2 books achieving nearly 100% cultural authenticity, while Grades 3 and 4 books started incorporating more cultural elements, albeit with a focus on American culture over Chinese culture; (c) a significant increase in authenticity from Grade K to Grade 6 books, indicating a shift towards more authentic representations of Chinese culture in the newer Grade 6 textbooks; and (d) a notable trend in the absence of animals or anthropomorphized characters in Grade 6 books, reflecting a more realistic exploration of interactions as students advance through the grades.

Administration of the Teacher Survey

Initially, the researcher contacted the Director of the Utah Chinese DLI program about forwarding the survey to Grades K-6 Chinese teachers throughout the state via email. However, the Director was ultimately not allowed by the Utah State Board of Education to forward the survey to protect teachers' contact information. Alternatively, the researcher recruited participants through word of mouth and social media posts shared on the researcher's Facebook account. Approximately 25% of current Utah DLI Chinese teachers responded to these invitations. Thirty-three teachers completed the survey, with an additional seven providing only basic demographic information. Two teachers identified themselves as Caucasian: both with experience living in Chinese-speaking

countries. One teacher lived in Taiwan for 2.5 years and studied abroad in China, while the other lived in Taiwan for 2 years as a church missionary. Detailed demographic information is summarized in Table 4.12. More than two-thirds of the respondents hold graduate degrees with a mean of 6 years of experience as Chinese DLI teachers in Utah. Thus, the sampling represents experienced and educated professionals and predominately native-Chinese language users.

Table 4.12

Responding Teachers' Demographic Information

Ages (N = 40)	Ethnicity (N = 40)	Birthplace (Country) (N = 40)	Mean Chinese teaching years	Mean Chinese teaching years in Utah Chinese DLI programs	Highest degrees (N = 40)
20-30 (n = 9)	Asian (n = 38)	China (n = 20)	7.7 years	5.7 years	Bachelors (n = 15)
31-40 (n = 15)	White (n = 2)	Taiwan (n = 16)			Masters (n = 22)
41-50 (n = 8)		Hong Kong (n = 2)			Ph.D. or Ed.D. (n = 3)
51-60 (n = 7)		U.S. (n = 2)			
above 60 (n = 1)					

Results of the 5-point Likert-Scale Statements

For this study, the teacher survey included several demographic items and 19 Likert-scale items. These scaled items were statements that Utah Chinese DLI teachers rated from 1 to 5 to express their perceptions of how the *Mandarin Matrix* curriculum supports students in developing pragmatic use of Chinese. The statements were initially

organized randomly (see Appendix A), with multiple items targeting five categories: Language Skills, Authenticity, Culture, Resources, and Motivation. To better represent the teachers' perceptions, all items were clustered into five categories by relatedness as shown below in Table 4.13. Mean scores, ranges, and standard deviations were calculated to analyze the teachers' responses.

Based on results, each survey item's responses ranged from 1 to 5, which implies that teacher perceptions varied. The mean of all mean scores was 2.80, and the mean of all standard deviations was 1.021. Thus, the data tended to cluster around a mean score of 2.80, with a moderate amount of variability around this central tendency. For the 19 items, the mean scores ranged from 2.15 to 4.02, with only one item having a mean above 4.0. Nine items (50% of the total) had mean scores below 3.0, but none were below 2.0. Item 18 obtained the highest mean score of 4.02 (*SD* = 1.099), indicating that many teachers perceived *Mandarin Matrix* as offering valuable Chinese reading resources for students. However, there was some variability in teachers' perceptions. Most respondents (78%) viewed the resources positively, rating Item 18 as a 4 or 5, but a portion of teachers (22% of respondents) either disagreed or strongly disagreed about the effectiveness or adequacy of the *Mandarin Matrix* materials. Conversely, Item 1(noted above) rendered the lowest mean score of 2.15 (*SD* = 1.233), suggesting that respondents expressed skepticism about the *Mandarin Matrix* curriculum's usefulness in enhancing students' comprehension of authentic reading materials such as newspapers, magazines, journals, or novels. The standard deviation for this item indicates marked diversity. More than half of the teachers (63% of respondents) doubted its validity, but others held more

optimistic views on the curriculum supporting students' comprehension of authentic materials beyond the *Mandarin Matrix* textbooks. This finding is not unexpected as teachers at different grade levels might value this goal differently or represent the teachers' awareness that the K-6 program does not target more mature reading proficiency for L2 learners.

Table 4.13

Mean Scores, Ranges, and Standard Deviations of K-6 Chinese DLI Teachers Responses

Statements	Mean Score	*SD*	Range
Language Skills (Listening, Speaking, Reading, Writing)			
1. I view *Mandarin Matrix* textbooks as improving students' Chinese reading comprehension of a variety of materials (e.g., newspapers, magazines, journals, novels, etc.).	2.15	1.233	1-5
2. I view *Mandarin Matrix* textbooks as motivating students to do additional Chinese reading and writing outside of the classroom.	2.39	1.099	1-5
3. I view *Mandarin Matrix* textbooks as improving students' Chinese speaking proficiency.	2.91	1.039	1-5
4. I view *Mandarin Matrix* textbooks as enabling students to improve Chinese listening skills.	3.0	0.939	1-5
5. I view *Mandarin Matrix* textbooks as enabling students to improve their Chinese writing skills.	3.02	1.042	1-5
Category Mean Scores	*M* = 2.69	*MSD* = 1.070	
Authenticity of Content			
6. I view *Mandarin Matrix* textbooks as infusing more natural Chinese language and more Chinese culture across K-6 levels.	2.75	1.045	1-5
7. I view *Mandarin Matrix* textbooks as supporting students' familiarity with how Chinese people think and speak in real situations.	2.79	0.963	1-5
8. I view *Mandarin Matrix* textbooks as exposing students to language that native Chinese people use regularly in the real world.	2.85	0.878	1-5

(*table continues*)

Statements	Mean Score	*SD*	Range
9. I view *Mandarin Matrix* textbooks as supporting students to improve communicative competence with native-speaking Chinese people in real-life contexts.	3.02	1.042	1-5
10. I view *Mandarin Matrix* textbooks as helping students to learn natural Chinese language.	3.14	1.088	1-5
11. I view *Mandarin Matrix* textbooks as not having many words, phrases, or sentences that are directly translated from English.	3.47	1.035	1-5
Category Mean Scores	*M* = 3.0	*MSD* = 1.008	
Chinese Culture			
12. I view *Mandarin Matrix* textbooks as providing useful resources that help students connect their real-life experiences with Chinese culture.	2.93	1.042	1-5
13. I view *Mandarin Matrix* textbooks as supporting students in learning Chinese culture.	2.96	0.936	1-5
14. I view *Mandarin Matrix* textbooks as promoting cultural understanding that supports reading comprehension.	3.03	0.999	1-5
15. I view *Mandarin Matrix* textbooks as increasing students' intercultural understanding (including the similarities and differences between Chinese and American cultures).	3.03	0.904	1-5
Category Mean Scores	*M* = 2.98	*MSD* = 0.970	
Resources			
16. I view *Mandarin Matrix* textbooks as sharing interesting resources for learning Chinese.	3.00	1.015	1-5
17. I view *Mandarin Matrix* textbooks as providing good resources to help students learn vocabulary that they need in social situations.	3.23	0.971	1-5
18. I view *Mandarin Matrix* textbooks as offering resources for helping students learn to read in Chinese.	4.02	1.099	1-5
Category Mean Scores	*M* = 3.41	*MSD* = 1.028	
Motivation			
19. I view *Mandarin Matrix* textbooks as enhancing students' motivation for learning different languages.	2.54	1.047	1-5
Means of All Means and *SD*	*M* = 2.80	*MSD* = 1.021	

Language Skills

Among the 19 scaled items, five individual items were grouped because they

relate to language skills development. The mean of means for these items was 2.69, suggesting that teachers did not strongly agree across these items. This suggests that respondents were less convinced about the effectiveness of the *Mandarin Matrix* curriculum in facilitating students' ability to communicate competently in the various language modes.

The teachers held a more consistently neutral stance about the effectiveness of the *Mandarin Matrix* in enhancing students' speaking, listening, and writing abilities, with very close mean scores of 2.91 (#3) 3.0 (#4), and 3.02 (#5), respectively. Teachers expressed more mixed views, reflected in larger standard deviations of 1.039 for speaking proficiency (#3) and 1.042 for listening skills (#4). Roughly one-third of teachers deemed the *Mandarin Matrix* effective in enhancing students' speaking and listening skills (with scores for #3 and #4 as 4 or 5), and approximately 30% of teachers disagreed (with scores for #3 and #4 as 1 or 2) with its effectiveness in these regards. Item 5 (writing skills) received a mean score of 3.02 with a lower variation (SD = 0.939) compared to Items 3 and 4. This suggests that teachers perceived the *Mandarin Matrix* curriculum more positively in supporting students' writing skills than listening and speaking skills. Reading and writing are typically interconnected literacy skills, but generally more difficult to develop than speaking and listening skills.

The mean score for Item 2 was 2.39, targeting how adequately the *Mandarin Matrix* curriculum motivates students to engage in additional Chinese reading and writing outside of the classroom. This score falls below 3.0, with a standard deviation of 1.099. The raw data reveals that only 12% of teachers highly rated *Mandarin Matrix*'s support

for students to read and write outside the classrooms. However, over half of the teachers (55%) rated this item as 1 or 2, suggesting that these teachers said there is room for improvement in this area.

Based on these results, teachers' perceptions of the *Mandarin Matrix* curriculum varied, with a general tendency towards neutrality or slight disagreement regarding its effectiveness in enhancing students' language skills, particularly in speaking, listening, and motivating students to read and write outside the classroom. Overall, these findings suggest that teachers were not particularly positive about the program's efficacy in supporting Chinese language skills.

Authenticity of Content

As with categorizing survey items targeting Language Skills, six prompts were clustered under the heading Authenticity. Items 6, 7, and 8 (as listed above) targeted authentic language communication, with mean scores of 2.75, 2.79, and 2.85 respectively. Falling below 3.0 with a standard deviation close to 1.0, these three mean scores indicate that approximately 40% of respondents perceived that the language presented in the textbooks does not always accurately reflect how Chinese is naturally spoken or used in everyday contexts. Indeed, 42% of teachers deemed the integration of cultural content across different levels (K-6) as insufficient. For both aspects discussed, these lower ratings were predominantly from respondents teaching lower grades. These results might reflect the fact that early grade instruction of a new language entails basic vocabulary and simplified syntax, rather than more authentically natural communication.

Item 9, assessing teachers' perceptions of the *Mandarin Matrix* textbooks' role in

enhancing students' communicative competence with native-speaking Chinese individuals in real-life situations yielded a mean of 3.20. Item 10 with a mean score of 3.14, and Item 11 (M = 3.47) regarding the presence of English-translated words, phrases, or sentences in the *Mandarin Matrix* textbooks suggest that teachers generally hold a slightly positive view in this regard. This is somewhat contradictory to results of the content analysis, which indicated that the *Mandarin Matrix* books exhibit high levels of linguistic and cultural authenticity. The contradiction could arise from varying interpretations of the survey questions. Differing standards for what constitutes authentic or natural language in texts may also contribute to the discrepancy in responses. These teachers may have particularly high expectations of the program's content.

Chinese Culture

Regarding exposure to Chinese culture, the mean of mean scores across four items for this aspect was 2.98, with a standard deviation of 0.970. Thus, teachers tended to agree that *Mandarin Matrix* effectively supports students' learning of Chinese culture and promotes intercultural awareness. This suggests that while teachers recognize the role of *Mandarin Matrix* in fostering cultural awareness as part of reading comprehension (as indicated by the mean score of 3.03 in Item 14), there was a lack of stronger agreement. This result implies a possible need for further enrichment or depth in the materials to better fulfill these objectives.

Resources and Motivation

The three items collectively assessing teachers' perceptions of the *Mandarin*

Matrix curriculum as providing resources for learning Chinese, had a mean of mean score of 3.14, higher than the other categories. Thus, these teachers perceived the *Mandarin Matrix* textbooks as moderately beneficial in providing resources for Utah Chinese DLI students. Specifically, the highest mean score ($M = 4.02$) indicates that the teachers perceived the *Mandarin Matrix* curriculum to offer valuable resources for students learning Chinese. Conversely, the mean score for Item 19 was 2.54, indicating that respondents tended to disagree that the *Mandarin Matrix* curriculum motivates students to learn different languages. While teachers indicated that *Mandarin Matrix* provides engaging resources for learning Chinese, they perceived this series as less effective in boosting students' motivation for other language learning endeavors. When the two items (#2 and #19) mentioning motivation are considered jointly, they have some of the lowest means (2.39 and 2.54, respectively). Their average mean of 2.47 is lower than those of the other categories. Essentially, the responding teachers seemed to indicate a need for materials that are more motivating for students.

Teacher Responses to Short-answer Questions

Four open-ended questions were also included in the survey.

1. How frequently do you use the *Mandarin Matrix* textbooks when teaching Chinese?
2. What do you believe to be the advantages of *Mandarin Matrix* materials in helping DLI students learn Chinese?
3. What do you believe to be the limitations of using *Mandarin Matrix* materials to help DLI students learn Chinese?
4. Which classroom activities do you typically use to teach *Mandarin Matrix* texts?

Teachers' Reported Use of Mandarin Matrix Textbooks in Class

Of the 40 respondents, 32 reported their frequency of using the *Mandarin Matrix* textbooks in class. Some teachers' responses were clear, specifying the exact number of days they use the textbooks, but others provided vaguer responses such as "80%" or "more than 3 days a week." These two types of responses were categorized as "Almost Daily." Similarly, responses such as "Thursdays" were considered weekly. All responses are summarized in Table 4.14, presenting teachers' reported utilization of the *Mandarin Matrix* textbooks.

Table 4.14

Teachers' Reported Use of Mandarin Matrix Textbooks in Class

Teachers reported usage	Numbers of teachers	Percentages	Teacher comments
Daily	13	41	"I used it every day when I taught."
Almost daily	12	38	"It is my current curriculum, so almost daily."
3 times a week	2	6	-
2 to 3 times a week	3	9	-
Weekly	2	6	"We use it pretty much every Thursday. Students would sometimes go on Mandarin Matrix website to listen to the books there on their own time at home or in class."
Total	32	100	

Essentially, a combined total of 79% of respondents reported nearly daily use of the *Mandarin Matrix* curriculum. Another 15% reported using the program multiple times a week. Only a very small subgroup (6%) indicated minimal use of the program. A Grade 4 teacher noted using the *Mandarin Matrix* books exclusively on Thursdays, while

acknowledging that students occasionally engage with tasks independently on the program's website. Similarly, another Grade 4 teacher emphasized that if the *Mandarin Matrix* curriculum was not the central curriculum, its usage would decrease from four days to just once a week. Although there is no explicit directive from the state regarding the frequency of program use, such expressions may represent some teachers dislike of the *Mandarin Matrix* textbooks. One teacher mentioned integrating practice sessions for listening and speaking on the *Mandarin Matrix* online platform, implying that relying solely on reading textbooks might not be sufficient for developing listening and speaking skills. Additionally, another teacher's preference for daily use of worksheets but textbooks only three times a week seems to indicate prioritizing students' writing skills.

Perceived Advantages of the Mandarin Matrix Textbooks for DLI Students

Again, not all, but 32 teachers provided brief written input of how they think the *Mandarin Matrix* textbooks benefit Utah Chinese DLI students. A review of all open-ended responses afforded an initial understanding of the teachers' perspectives. Descriptions that appeared repeatedly were noted during this initial review. Then, open coding of all responses, led to assigning descriptive labels. Recurring ideas and opinions expressed by the teachers were identified, and similar sentiments were grouped together to form initial categories.

Subsequently, axial coding was employed to refine the initial categories and determine subcategories within each main category. This process involved examining the relationships between categories and finding connections or distinctions among different

aspects of teachers' perceptions. Continuous comparison across categories enabled a comprehensive capture of teachers' insights. Ultimately, the categories were finalized, ensuring they were mutually exclusive and collectively exhaustive (Saldaña, 2016). The finalized categories are summarized with their tabulated frequencies in Table 4.15. Interestingly, these teachers reported a wide variety of program advantages (N = 43), but there was no clear advantage identified by this sample.

Table 4.15

Teachers' Expressed Advantages of Mandarin Matrix Textbooks

		Frequency	
Question	Category	*n*	%
What do you believe to be the advantages *of Mandarin Matrix* materials in helping DLI students learn Chinese?	Support literacy skills	10	24
	Offer spiraled vocabulary	9	21
	Engage readers	7	16
	Promote speaking/listening skills	4	9
	Provide curriculum	4	9
	Offer manageable content	4	9
	Include supplemental resources	3	7
	Integrate culture	2	5
Total		43	100

Supporting Language Skill

According to responses, these teachers valued the *Mandarin Matrix* curriculum as effectively supporting students' reading, writing, speaking, and listening skills in Chinese. However, there was a greater emphasis on literacy skills (n = 10)—reading and writing—compared to speaking and listening (n = 4). The teachers noted that the

curriculum encompasses a range of topics including family, school life, and holidays, offering students exposure to language usage in diverse contexts and situations. Teachers also reported that they appreciate the program's illustrations, which ostensibly aid students' comprehension of the content. Writing skills are emphasized through *Mandarin Matrix's* supplementary resources such as worksheets. These responses are in line with the curriculum's objective of offering a comprehensive reading program for Utah DLI Chinese programs.

Offering Spiraled Vocabulary and Engage Readers

Responding teachers highlighted that the spiraling of vocabulary (n = 9) in the *Mandarin Matrix* texts benefits students' word learning via repeated exposure across the K-6 textbook. As one teacher noted, vocabulary is introduced and reinforced in a progressive manner, allowing students to build their vocabularies incrementally.

Regarding engagement, the teachers positively perceived the story-based approach of the *Mandarin Matrix* books for exposing students to different contexts. Ostensibly, students could be motivated to learn the *Mandarin Matrix* content while also developing their comprehension skills in an enjoyable way. Teachers may deem dialogue-based stories engaging because they provide students with culturally relevant contexts, helping them to better understand language usage in real-life situations. However, the integration of cultural elements was not extensively mentioned by teachers (n=2), indicating a potential area for improvement within the *Mandarin Matrix* curriculum or how teachers are trained to use it.

The teachers also noted the advantages of *Mandarin Matrix's* online games and interactive activities in promoting students' engagement and motivation. These digital resources offer students opportunities to practice language skills and enhance their overall learning experience. A few teachers described the online resources (n = 3) as valuable tools, offering students opportunities to practice and review Chinese outside of the classroom. The online platform provides audiobooks that include both core curriculum and supplementary readings. One teacher noted, "*I think the student learning platform (but it's not free) is very helpful. And there are many supplement [sic] readers related to other subjects (science, math, culture, etc.) which benefit the students a lot*." This description underscores how the supplemental resources provided by *Mandarin Matrix* offer valuable reinforcement and may help students make connections across different subjects.

Providing Curriculum and Offering Manageable Content

According to responding teachers' perceptions, the *Mandarin Matrix* textbooks offer ready-made content for teaching, alleviating the need for them to develop their own curriculum. Teachers found the texts in the *Mandarin Matrix* books to be crafted in a manner that is comprehensible for students. Upon closer examination of teachers' responses, the lower-grade teachers more often deemed this series particularly beneficial for beginning learners. They valued the simplicity of vocabulary and syntax, which allows them to introduce Chinese language concepts effectively. On the other hand, more upper-grade teachers noted that the passages are shorter and less complex compared to

those in other textbooks. This perception suggests that these teachers indicated that the *Mandarin Matrix* curriculum may be better suited for elementary-grade students, affording positive experiences at the beginning stages of learning Chinese.

Recognizing Limitations in Mandarin Matrix Textbooks

Like steps noted above regarding teachers' comments about the program advantages, teachers' perceptions of limitations of the *Mandarin Matrix* textbooks were coded and then categorized. A total of 47 limitations were noted, then categorized. The main limitations related to insufficient support of progress and motivation, but the comments were not easy to understand nor group. The finalized categories are summarized with their frequencies shown in Table 4.16.

Table 4.16

Teachers' Expressed Limitations of Mandarin Matrix Textbooks

		Frequency	
Question	Category	*n*	%
What do you believe to be the limitations of using *Mandarin Matrix* materials to help DLI students learn Chinese?	Hinder students' progress	13	27
	Reduce motivation	9	19
	Lack authenticity	8	17
	Limit cultural connection	6	13
	Require teachers' adjustment	4	9
	Present difficult content	4	9
	Present long passages	2	4
	Cost	1	2
Total		47	100

Hindering Students' Progress

Some teachers (n = 13) voiced concerns that the *Mandarin Matrix* textbooks impede students' progress because of several shortcomings, including simplicity, limited vocabulary, and insufficient speaking and writing practice. A few teachers noted that the storylines in the *Mandarin Matrix* materials are overly simplistic, containing only a few instances of conflict present within a story. Additionally, the incorporation of basic sentence structures and vocabulary purportedly renders the content too easy for students. One 5th-grade teacher remarked, "*Simple sentence structures that are below their actual age group, the textbook only exposed them with easier phrases while in real life they're maturer than that level*." This simplicity is also reflected in the paucity of genres. A Grade 6 teacher highlighted, "*The genre is always stories. I feel students need to read more than just fiction stories.*" This perception might not be based on a systematic analysis or count but suggests a need for a broader range of genres. Such expansion could enhance students' exposure to diverse texts and content, thereby enriching their linguistic and literary development.

Teachers also expressed concerns about the inadequacy of the vocabulary provided in the curriculum, which could hinder students' language development for both daily-life encounters and academic purposes. A teacher with experience teaching Grades 2 and 4 remarked, "*For upper graders, a ten-page textbook with 2-4 sentences per page holds back students' Chinese learning progress*." A comment from a Grade 3 teacher highlighted, "*It limits students' skills in using vocabulary for both daily-life and academic conventions.*" Additionally, teachers raised concerns about the disconnect

between the content and students' daily experiences, making it challenging for them to establish meaningful connections to their own lives. A few teachers (*n* = 4) noted insufficient speaking and writing practice opportunities within the curriculum, which could hamper students' proficiency in spoken and written Chinese.

Reducing Motivation

As indicated earlier, several teachers expressed positive views (*n* = 7) regarding the engaging nature of *Mandarin Matrix's* story-based content. However, a slightly higher number of teachers (*n* = 9) noted that the content might not be sufficient for engagement for various reasons. Echoing the simplicity of plots and stories, disengagement emerged as the second most raised issue (following progress concerns) among teachers when asked about limitations. One Grade 2 teacher expressed, "*The creativities seem to be limited to a few styles, form or setting. It is hard to (m)notivate the students to read it again and again*." A Grade 6 teacher added. "*They [students] begin to lose interest in the same characters in the 5th book*." These comments underscore a lack of diversity in both story characters and situations in the *Mandarin Matrix* curriculum, which might contribute to students' diminished engagement with the material.

Lack of Authenticity and Limited Cultural Connection

Concerns voiced by teachers included the authenticity of the Chinese language and the integration of Chinese culture (*n* = 6) within the *Mandarin Matrix* textbooks. Most teachers with this concern primarily were teaching lower-grade students. A Grade 3 teacher noted, "*Sometimes we run into parts of phrases or manner of speech is not [sic]*

native-like (in Mandarin)." Similarly, another teacher mentioned, "*The language is not natural, especially in first grade*." In addition to less authentic language, a couple of teachers noted the lack of connection to Chinese cultural understanding or opportunities for cultural comparison. A different Grade 3 teacher commented, "*This series hasn't provided too much connection with cultural understanding or connection between Asian culture and Western culture*." One Grade 2 teacher noted, "*The materials can only introduce Chinese culture in a superficial level*." These two comments are consistent with the teachers' responses to the Likert-scale statements about authenticity. Approximately 30% of respondents rated statements regarding the integration of authentic Chinese language and culture in the *Mandarin Matrix* books as 1 or 2 out of 5.

Difficult Content and Requiring Teacher Adjustment

Resonating with concerns mentioned earlier, a few teachers (n = 3) worried that the content is not adequately aligned with students' proficiency levels (i.e., too easy). However, other teachers observed that the texts in the *Mandarin Matrix* curriculum pose comprehension challenges for students, requiring extensive scaffolding from teachers. A Grade 1 teacher noted, "*It isn't something I can teach without a lot of scaffolding*." A couple of teachers also expressed concern that the cultural connection is not effectively presented in the texts, making content difficult to comprehend. Addressing this issue could require significant effort from teachers to scaffold the reading to support students' comprehension, perhaps with visuals, key questions, or think-alouds. A teacher with two years of Chinese teaching experience in Utah, instructing students in Grades 1 and 3,

remarked, "*The combination of units is sometimes confusing, with difficulty levels inverted. Adjustment(s) are needed in actual teaching.*" The mention of "combination of units" and "difficulty levels inverted" indicates that there might be inconsistencies with the sequencing of the content, making it challenging to access the material effectively. The mention of needing teaching adjustments or modifications may indicate the rearranging of units or offering supplementary information to enhance students' comprehension and engagement with the texts. Another Grade 3 teacher commented, "*This series hasn't provided too much connection with cultural understanding or connection between Asian culture and Western culture. It requires lots of extension from teacher effort to make that connection in classroom.*" As mentioned earlier, some teachers expressed their appreciation for the ready-to-use *Mandarin Matrix* curriculum, but they found that extra work is still required. One of the Grade 4 teachers noted, "*Teachers still need to create so many things by themselves for using this material*." These comments suggest that while the *Mandarin Matrix* curriculum provides program content, it can require adaptation and supplementation from teachers to effectively meet the needs of their students.

Content and Cost

Only a couple of teachers (n = 2) raised concerns about the extensive content of the materials. These teachers did not provide further explanation about this concern. However, it could suggest that the lengthy content makes it challenging for students to retain information effectively or maintain interest in extended reading. Additionally, a teacher mentioned that the materials are pricey, which echoes the acknowledgment by the

Utah Chinese DLI's Director. According to *Mandarin Matrix* (2023a), one set of printed books from Unit 1 to Unit 10 for a single student can cost $240 US dollars. If a class set consists of 25 students, it would total $6,000 per class. Additionally, in the event of a lost or damaged book, necessitating replacement due to poor condition, the school is required to purchase an entire set of books, as *Mandarin Matrix* does not offer single book sales. Moreover, for a DLI class set (N = 50), the cost for providing students access to *Mandarin Matrix's* online platform totals around $2,000 annually. The cost of the materials and online access could pose a barrier for schools or districts with limited budgets, potentially impacting access to the curriculum for students.

Teacher-Reported Activities Incorporated with the Mandarin Matrix Textbooks

Teachers' perceptions of the limitations of using the *Mandarin Matrix* books shed light on how such constraints influence their efforts to enhance students' language proficiency. The 32 participating teachers also provided insights into various activities (27 different ones) they have integrated when teaching with the *Mandarin Matrix* textbooks. The categories listed in Table 4.16 were determined through a four-step process. Initially, different types of language learning activities used in classrooms, including reading, listening, writing, and speaking activities, were identified. Vocabulary practice, comprehension skills, and grammar instruction were also identified as labels at this step. The next step involved listing specific activities under these initial labels. For instance, group reading, individual reading, and paired reading were categorized under reading activities. Similarly, handwriting tasks and writing homework were grouped

under writing activities. Subsequently, similar activities were clustered together to form broader categories. For example, listening to texts, summarizing stories, and asking questions are related to comprehension, leading to its inclusion in the comprehension skills category. The final step involved refining labels for each category to accurately represent the types of activities reported and ensure clarity. The frequencies of teacher reported activities are tabulated and summarized in Table 4.17. Although the respondents mentioned 27 different activities, unfortunately, the responding teachers' explanation of them was often minimal, making it difficult to understand how the noted activities related to the program and textbooks content.

Table 4.17

Teacher Reported Activities Implemented with Mandarin Matrix Textbooks

		Frequency	
Question	Integrated activity	*n*	%
Which classroom activities do you typically use to teach *Mandarin Matrix* texts?	Reading engagement	43	41
	Comprehension activities	18	17
	Oral communication exercises	17	16
	Vocabulary reinforcement activities	13	13
	Written tasks	12	12
	Grammar instruction	1	1
Total		104	100

Reading Engagement

Reading engagement was categorized based on responses indicating that teachers utilized activities to actively engage students in reading *Mandarin Matrix's* texts. This category emerged as the most mentioned augmentation among these teachers, indicating

some emphasis on enhancing students' reading involvement within the curriculum. Notably, half of the activities categorized under reading engagement referenced doing a picture walk. A picture walk is a technique by which learners preview a series of images related to a story before reading or listening to the corresponding text. This activity helps learners activate their prior knowledge, predict what the text might be about, and make connections among background knowledge, images, and the upcoming content (Ness, 2017). Using picture walks to introduce a text has received significant emphasis during semi-annual Chinese DLI teacher training sessions conducted by the State developers. The trainers have emphasized that this technique aligns with research (Maderazo et al., 2010; Martens, 2012; Pantaleo, 2020) on visual literacy (Chinese DLI Professional Learning) and supports students' interpretation of visual information alongside textual content. Training has also stressed that this method of introducing a text helps students develop reading skills such as activating prior knowledge and making predictions, which are crucial for comprehension.

Using several grouping formats related to reading were also noted, including whole group, small group, pair, and individual readings. However, without additional context from the respondents, mentions of options, such as "individual reading", were difficult to interpret. It is unclear whether students engage in silent reading, read aloud, or how the teacher utilized such options to teach language or literacy. Only one teacher explicitly mentioned teacher-led reading, although it remains unclear whether this entailed student reading. A noteworthy mention came from a teacher who highlighted the integration of boy-girl reading, cloze reading, and weird voice reading techniques during

instruction. A much better understanding of how teachers use the *Mandarin Matrix* program to teach students to read is surely needed.

Reading Comprehension Activities

Responding teachers reported engaging students in predicting what may happen in the story more frequently than other activities such as asking questions, summarizing stories, and explaining the plot. One teacher noted that students predicted various story elements, including characters, settings, and plots. Research supports the effectiveness of prediction in story comprehension. According to Chaturvedi et al. (2017), predicting story outcomes helps students engage with the material, accurately discern the sequence of events, and identify the main claims presented in the narrative.

Oral Communication Exercises and Vocabulary Reinforcement Activities

Although the *Mandarin Matrix* materials are primarily designed for teaching reading, teachers mentioned efforts to enhance students' oral proficiency through the implementation of speaking activities. Among these activities, "role play" or acting out scenarios was noted in 8% of the reported activities. Several other oral activities were utilized, including retelling, pair sharing, and group discussions. However, the responses from teachers lacked details regarding the speaking activities used in conjunction with the *Mandarin Matrix* materials. Further elaboration would be needed to understand how these activities help enhance students' speaking skills or communicative competence.

Some teachers highlighted that learning new or key vocabulary is essential for understanding texts. Five teachers mentioned implementing games or apps such as

Gimkit, Kahoot, NearPod, or Quizlet to support students in this regard. However, because no specific details were provided, it is unclear how these teachers use the games or apps and how they might support students in retaining vocabulary. A couple of teachers mentioned making word associations, but again there was insufficient explanation regarding how they conduct this activity.

Written Tasks and Grammar Instruction

Concerning writing, three lower-grade teachers mentioned character transcription, while two upper-grade teachers emphasized sentence or story writing. A Grade 1 teacher explained that drawing a picture on the top of a character helped students understand its meaning. The teacher expressed: "*For example, they [students] will draw a person with a hat walking for the Chinese character for walk*." This visual representation serves to reinforce the association between the character and its meaning, making the learning process more memorable. One teacher reported using worksheets offered by *Mandarin Matrix* each day. However, some teachers simply mentioned "writing" without specifying any particular writing tasks.

Grammar instruction was mentioned by a single teacher. This could suggest that grammar was not the primary focus and may not be emphasized by Chinese DLI teachers. This lack of emphasis on grammar may reflect a pedagogical approach that prioritizes other aspects of language learning, such as vocabulary acquisition, reading comprehension, and oral communication skills. Further exploration into the role of grammar in Chinese DLI classrooms might provide valuable insights into the broader instructional practices and strategies employed in these settings.

Results Summary

This study's analytical process involved extensive coding of the Grades K-6 *Mandarin Matrix* textbooks and summation of teacher survey responses. Subsequently, these analyses were integrated to comprehensively represent the research findings. During the coding process, a high level of inter-rater reliability (M = 97.6%) across six categories for linguistic and cultural authenticity was established by two coders: the researcher and an experienced Chinese DLI instructor with a doctoral degree in Education. Overall, the coded data suggests that the *Mandarin Matrix* textbooks consistently portray linguistic and cultural authenticity ranging from 90.41% to 100% across grade levels. Of note, the settings within K-4 books were deemed less authentic, ranging between 43%-58% across three categories related to cultural authenticity.

High Linguistic Authenticity

The analysis of word authenticity in the *Mandarin Matrix* textbooks from Grades K to 6 revealed consistently high percentages, exceeding 90% across all grades. The progression shows incremental increases in authenticity from lower to higher grades, with Grade 6 rated nearly 100% authentic. However, Grade 3 content showed a slight decrease compared to Grade 2, possibly due to the introduction of more varied vocabulary. Notably, the authenticity of sentence structure in textbooks for Grades K and 6 was considered nearly 100%, ranging from 99.11% to 100%. A slight decrease was observed from Grade K to Grade 2 and Grade 2 to Grade 3 books, but the differences were negligible. The high level of authenticity in Grade 6 texts suggests that the *Mandarin*

Matrix textbooks are designed to prepare students for more complex language tasks and refined language usage in subsequent grades. High authenticity was also shown for language use in different situations represented in the *Mandarin Matrix* textbooks from Grades K to 6 with percentages, ranging from 97.33% to 100%. The narrow range suggests that the textbooks represent communication patterns common among native-Chinese speakers.

High Cultural Authenticity

The evaluation of cultural authenticity of scenarios in the *Mandarin Matrix* textbooks from Grades K to 6 also revealed high levels of authenticity, with scores ranging from 92.42% to 98.76%. The number of illustrations decreases from Grade K to Grade 5, then increases in Grade 6 books. Overall, the *Mandarin Matrix's* textbooks show gradual integration of Chinese culture while providing relatable content transcending specific cultural boundaries.

The settings within stories had the lowest authenticity percentages compared to other categories in the *Mandarin Matrix's* books. Grades K to 2 books were below 60% in authentic settings, with Grades 3 and 4 falling even lower. Grade 5 books reached 60%, but it remained relatively low compared to Grade 6 books, which achieved 97.77% authenticity. The low percentages of authentic settings in Grades K to 5 books reflect predominant Western or American culture, with Grade 3 and 4 books focusing more on details of house style and decorations. However, the newly revised Grade 6 books show a significant increase in authenticity, reflecting a shift towards introducing more Chinese culture to higher-grade students. Grade 6 textbooks richly emphasize Chinese history,

poems, monuments, and cultural comparisons between Chinese and American culture. Human characters' behaviors in the *Mandarin Matrix* textbooks from Grades 1 to 6 range narrowly from 98.78% to 100%, although there are instances of animals or other non-human entities being anthropomorphized occurring in Grade 1 and 2 textbooks.

Overall Results of Teacher Survey

From the teachers' responses to the survey, it was found that 79% of them utilized the *Mandarin Matrix* curriculum daily or nearly every day. While teaching the *Mandarin Matrix* textbooks, reading development was highlighted as the primary focus among teachers. They reported various reading formats, including whole group, small group, paired, and individual readings, with picture walk being a predominant activity. This approach aligns with research on visual literacy and supports reading skills critical for comprehension. Predicting story outcomes was mentioned to enhance comprehension skills, which is supported by research demonstrating its effectiveness in engaging students and aiding comprehension (Black & Bower, 1980; Chaturvedi et al., 2017). While oral communication exercises were reportedly incorporated, details on specific activities were lacking. Vocabulary reinforcement activities, including games and word association, were mentioned but without clarification on implementation. In terms of writing tasks, character transcription and sentence or story writing were noted, with visual aids used to reinforce character meaning. Grammar instruction received minimal mention, which corresponds with the potential pedagogical focus on other language aspects such as vocabulary and reading comprehension. According to the teacher survey, responses to the 5-point Likert-scale statements indicate that teachers generally agree that

the *Mandarin Matrix* materials provide valuable reading resources for Utah Chinese DLI programs. The estimation is most evident for Item 18, which focuses on the resources offered by the *Mandarin Matrix* curriculum for students' Chinese learning. This item received the highest mean score of 4.02. Additionally, 78% of teachers rated this aspect as 4 or 5, signifying strong or near-strong agreement.

However, there was less agreement regarding the program's effectiveness in facilitating reading comprehension of materials outside school, with Item 1 receiving the lowest score (M = 2.15). On average, teachers perceived these materials as moderately facilitating students' language skills, with mean scores close to 3.0. Regarding the authenticity of content, approximately 40% of respondents felt that the language presented in the textbooks did not always accurately reflect natural usage. About 42% of teachers deemed the integration of cultural content insufficient. The mean score of 2.98 for the *Mandarin Matrix's* effectiveness in promoting intercultural awareness suggests some disagreement among teachers, although they recognized its role in fostering cultural awareness to some extent. Moreover, teachers generally disagreed that the *Mandarin Matrix* books motivate students to learn different languages.

In terms of the perceived advantages of the *Mandarin Matrix* textbooks, some teachers highlighted the focus on literacy skills, specifically reading and writing (24%), compared to speaking and listening skills (9%). Additionally, a few teachers (10%) deemed the curriculum easily comprehensible for students, especially beginners, and ostensibly appreciated the supplemental resources provided, including worksheets and online interactive activities. The online platform was seen as valuable for additional

practice outside the classroom. Moreover, some responding teachers (20%) perceived that the content of the textbooks facilitated learning through a spiraled approach to vocabulary and illustrations that enhanced students' comprehension. Teachers expressed gratitude for the targeted vocabulary and varied topics covered. However, despite these positives, some limitations were also mentioned by teachers in their open-ended responses.

As noted above, the responding teachers communicated shortcomings in several areas for supporting students' learning needs, including wanting more diverse and challenging content, greater authenticity and cultural relevance, and addressing concerns about the lengthiness of passages and the cost. The most pressing concern voiced by teachers was the hindering of students' progress because of limited vocabulary, simplistic storylines, and insufficient practice opportunities. Some teachers considered the targeted vocabulary inadequate for real-world encounters and academic purposes. Some teachers also noted that confusing content and lower-level sentence structure do not foster students' language proficiency.

Disengagement of readers emerged as another salient issue, attributed to the lack of diversity in story characters and plots. Regarding cultural enrichment, some teachers expressed concerns about the curriculum limiting students connecting to real-life experiences, insufficient focus on Chinese culture, and not fostering intercultural understanding, particularly in terms of Chinese and American cultural comparisons. Such concerns indicate possible areas of improvement in language authenticity and cultural relevance. Aligning the curriculum with students' proficiency levels and the need for teachers to adjust and modify difficult content were also noted. Finally, concerns about

the length of the passages and cost were raised. These challenges underscore the crucial role of teachers in integrating classroom activities with the teaching of the *Mandarin Matrix* materials to enrich students' learning experiences in DLI programs.

Additional Information Informing the Study

The researcher initially contacted the Director of the Utah Chinese DLI program to request support in forwarding the teacher survey to Utah Chinese DLI teachers. However, because of purported privacy regulations from the Utah State Board of Education, the Director was unable to obtain permission to distribute the survey. Despite this limitation, the Director generously granted an interview to provide background information on the development, publication, and implementation of the *Mandarin Matrix* materials within Utah Chinese DLI programs.

The interview took place shortly after Chinese New Year in early February 2024 and was conducted via Zoom. It lasted approximately an hour and offered insights into the intricate process of developing and refining a curriculum for a Chinese immersion program, spanning from 2015 to 2021. The Director highlighted challenges such as securing publishers willing to tailor materials to the program's needs while balancing language proficiency with comprehension. She recounted negotiations with various publishers during conferences or meetings, noting that the *Mandarin Matrix* company stood out for its willingness to adjust content to suit Utah's learning goals. Collaboration between entities like the Confucius Institute and *Mandarin Matrix* also played a pivotal role in the USBE's concern for cultural relevance and contextual learning within the

textbooks.

The interview with the Chinese DLI's Director addressed the involvement of stakeholders, budget constraints, and the need for curriculum adaptation (utilizing textbooks that match students' language proficiency levels) to better prepare middle-school students for Advanced Placement (AP) tests in Chinese. The state sought to adapt the curriculum to develop students' language proficiency to meet the demanding standards of AP exams. The Director emphasized the importance of collaboration, adaptability, and ongoing communication about curriculum development and implementation to support teachers and students effectively. Additionally, she highlighted the significance of cultural experiences in maintaining enrollment and fostering interest in Chinese language and culture among students and parents. She suggested that teachers consider organizing short-term study tours in China or Taiwan during breaks. However, she emphasized that the details should be discussed with school and district administrators to assess the budget and ensure proper planning and coordination.

The Director explained the introduction of a new version of K-6 *Mandarin Matrix* textbooks, which has been modified to include more authenticity. The updates aimed to integrate more natural language and cultural elements, promoting students' speaking habits such as incorporating colloquial expressions, idiomatic phrases, and culturally relevant content. The objective was to create a richer and more authentic learning experience for students. The ultimate objective is to enhance students' language proficiency by exposing them to real-life language usage and cultural contexts. Currently,

Grade 6 students are using the updated books across Utah. However, the availability of newer versions for other grades depends on school district funds for purchasing hard copies. As noted, a set of printed books for individual students per year is $240 US dollars. While the prices of these textbooks raise questions, one approach could be purchasing several sets each year to gradually incorporate them into the curriculum.

Limitations of the Study and its Procedures

This study employed content analysis and a teacher survey as data sources. Using two different data sources and analyses afforded a mixed-method approach to understand the required content and teachers' perceptions of the program. Still, as with any constrained investigations, some limitations apply. First, the content analysis was applied to only K-6 textbooks, which does not represent the entirety of the *Mandarin Matrix* curriculum. This restricted focus did not consider potentially valuable insights and variations that may be present in higher-level materials, thus, potentially limiting the comprehensiveness of the findings. Second, the pre-determined categories utilized for coding linguistic and cultural authenticity-imposed constraints on the analysis process. These constraints excluded aspects that could be considered, such as the extent of vocabulary complexity, frequency of idiomatic expressions, and punctuation used, all of which are related to linguistic authenticity. Concerning cultural authenticity, the predetermined categories limited the evaluation of elements excluding the ethnicity of people, traditional attire, and underlying religious beliefs depicted in illustrations. Such constraints could lead to overlooking nuanced representations of cultural authenticity

within the materials.

Third, the steps for coding and clustering teachers' open-ended responses were determined solely by the researcher. There was no co-coder involved in the process, which may have impacted the reliability and objectivity of the clustering method. This lack of collaboration could have allowed biases or overlooked nuances in the data. Furthermore, without a second coder to verify the open-coding process, there may be a higher risk of misinterpretation or misclassification of responses. This highlights a potential limitation in the methodology and suggests the need for future studies to incorporate collaborative coding processes of open-ended responses to ensure rigor and accuracy in all data analyses.

Fourth, the reliance on a teacher survey for data collection introduced the possibility of response bias. Teachers' perceptions and experiences could have been influenced by various factors such as personal preferences, professional training, teaching styles, or varied exposure to alternative materials. Additionally, variations in teachers' perceptions might have arisen due to differences in their cultural backgrounds, educational experiences, English proficiency levels, familiarity with the *Mandarin Matrix* curriculum, or their comfort level in responding to specific questions. Importantly, the teachers might have provided more detailed explanations and additional context if the questions and the responses had been in Chinese. This is significant because language proficiency can greatly influence the depth and nuance of communication. Responding teachers' English proficiency could potentially have restricted their ability to fully articulate their perspectives, insights, and concerns. Consequently, the data collected may

not have fully captured the intricacies of their experiences and viewpoints.

Fifth, only 40 teachers responded to the teacher survey, with only 32 of them responding to all questions. This limited sample size raises important concerns about the representativeness of the findings for a broader population of educators' perceptions. The smaller sample size may not capture the full spectrum of opinions and experiences among teachers who utilize the *Mandarin Matrix* curriculum. Additionally, the questions selected in the survey were a reasonable number and length for teachers, but they may not sufficiently address all relevant aspects of teachers' experiences with the curriculum, thereby limiting insights gathered.

Moreover, factors such as the timing, context, and mode of survey administration could have also contributed to variations in interpretation among respondents. As such, caution is warranted when interpreting the survey results, and future studies could benefit from a larger and more diverse sample to ensure robust and reliable findings. Last, the study did not include direct observation of classroom practices or student performance, relying instead solely on teacher self-reports. Without direct observation, understanding how the curriculum is implemented in real classroom settings is minimized. The important element of how students interact with the material was not scrutinized in this research, which could be essential in future research. These limitations highlight the need for caution in interpreting the findings and suggest avenues for future research to address these gaps. Further investigation could explore additional dimensions of teachers' experiences with the *Mandarin Matrix* curriculum, such as the effectiveness of specific teaching strategies, exploring approaches to better align with students' cultural

backgrounds, values, and experiences, and examining integration of technology in language instruction. Moreover, qualitative studies incorporating interviews or focus groups could provide deeper insights into teachers' perspectives and practices, enhancing our understanding of the complexities involved in language education and utilizing purchased programs within Utah Chinese DLI programs.

CHAPTER 5

DISCUSSION

Through content analysis and a teacher survey, this study provided integrated results regarding the extent of linguistic and cultural authenticity of K-6 *Mandarin Matrix* textbooks, as well as the perceptions of 33 Chinese teachers regarding their use of the materials. The content analysis sought to determine the extent of authenticity integrated into the *Mandarin Matrix* books. The Likert-scale statements in the teacher survey captured ratings from 1 to 5 (1 indicating least agreement and 5 indicating strong agreement) from both Chinese natives (N = 31 and American teachers (N = 2), regarding the effectiveness of respective grade-level books as resources for supporting students' language and literacy skills, cultural understanding, and motivation in learning foreign languages. Additionally, the teachers' responses to four open-ended questions facilitated an exploration of several instructional aspects, targeting the frequency of the *Mandarin Matrix* materials' utilization, insights into the advantages and limitations of the *Mandarin Matrix* books, and the integration of activities when teaching texts from the *Mandarin Matrix* books. This chapter includes discussion of (1) salient findings and interpretations; (2) additional limitations; (3) recommendations for future research (4) instructional implications; and (5) a conclusion.

Salient Findings of Linguistic Authenticity in *Mandarin Matrix* Textbooks

Via content analysis, two coders observed significantly high degrees of authenticity in language usage within the *Mandarin Matrix* books, with overall

percentages across grade levels ranging from 86.3% to 100% across three categories: word selection (*M* = 93.40%), word order (*M* = 99.62%), and language used situationally (*M* = 99.04%). The aim was to ascertain whether each sentence accurately portrays real-life communication of native-Chinese speakers in these three aspects. These findings contradicted an initial concern that arose while teaching the *Mandarin Matrix* curriculum in the Utah Chinese DLI program, and hearing complaints about inauthenticity in the *Mandarin Matrix* books from teachers during the State's training sessions. The high levels of authentic language found in the *Mandarin Matrix* materials across K-2 books (*M* = 96.65%), Grades 3-4 books (*M* = 96.99%), and Grades 5-6 books (*M* = 98.42%) were impressive. These percentages also demonstrate incremental differences in authenticity from lower- to higher-grade books.

Concordant with the notable results for linguistic authenticity, the coding and analysis afforded insights about how to evaluate the appropriateness of the words used to expose students to a new language. The category of "word used" may not have adequately considered the nuances of denotation and connotation of the language samples. While the complexity of vocabulary is important, it is equally crucial to recognize how words carry both literal meanings (denotation) and additional layers of implied meanings or associations (connotation) in genuine communication (Schmitt & Schmitt, 2014; Shakibaei et al., 2019). Another examination of the K-6 *Mandarin Matrix* textbooks could highlight the diverse language functions (Byram, 2021), revealing if they progressively promote students' language competence. Such research could better reflect the richness and variability of language used in real-world communication. For example,

in Grade 6 books, both the idiom of "百闻不如一见 (seeing is believing)" and the proverb "不到长城非好汉 (Trans., If you don't reach the Great Wall, you are not a hero)" have implied meanings. In "百闻不如一见 (seeing is believing)," the character "百 (one hundred)" conveys the idea of "a lot of" rather than its literal meaning of "hundred," and the literal meaning of "闻" is "to smell," but in this context, it signifies "to hear." The proverb "不到长城非好汉 (Trans., If you don't reach the Great Wall, you are not a hero)" describes a person's willingness to confront obstacles and adversity, demonstrating courage, resilience, and perseverance. The meanings of words used in phrases can enrich students' authentic language input, which was challenging to capture solely through coding words as done in this study.

Furthermore, syntax includes more than just word order; it also involves tense and agreement (e.g., subject-verb agreement). In the coding process, only the arrangement of words in each sentence was assessed. Sentence length and complexity were not evaluated. Longer sentences may indeed exhibit greater syntactic complexity, but without careful consideration of sentence structure, authenticity may decrease. An example from the Grade 6 book: "游学团在故宫参观了一个早上, 当天晚上他们就要坐飞机回美国 (Trans., The study tour group spent the morning exploring the Forbidden City, and that same evening they flew back to the United States)." This example employs a typical Chinese sentence structure, with the subject preceding the verb and object, and additional adverbial phrases providing temporal information. The verb "参观了(visited)" is completed by the object "一个早上 (one morning)," indicating the timing of the visit.

The adverbial phrase "当天晚上 (that same evening)" further specifies the time frame. Finally, the action of leaving is expressed using the verb "坐(sit)" followed by the destination "美国 (the United States)." However, there could be connecting words such as 然而, 但是, or 不过 (these words mean however) to express that this visit to the Forbidden City is the last trip while in China. Evaluating such elements could elucidate the complexity of syntax. Still, it is important to note that the authenticity ratings for syntax in this study were stable across grade levels, which could be a strength of the program, especially because the beginning texts included more basic language labels before introducing word order.

Across the K-6 books, the depicted situations were coded as highly authentic (*M* = 99.04%). This authenticity likely arises from most texts portraying scenarios related to school life, family events, and interactions with friends. These situations are relatable and plausible, allowing readers to envision them occurring in their own lives. In this case, relatively few fanciful situations contributed to the overall authenticity. However, Grades K-1 and Grade 5 books exhibit lower degrees of authenticity (Grades K-1 = 98.58%, Grade 5 = 97.33%) compared to other grade levels. For example, Grades K-1 books contain overly simplified sentences, such as "女生, 四 (Girl, four)," which is simplified from the sentence "女生们得了四分 (Girls scored four)." Such simplification leaves ambiguity because "女生, 四 (Girl, four)" can be interpreted as referring to either "a girl whose number is four" or "girls get four of something." The simplicity of such labeling, which lacks context and clarity, poses challenges in understanding the represented situation. In Grade 5 books, there are sentences depicting unrealistic scenarios, such as

buying clothes or making clothes for a fish. The improbable situation may confuse students and detract from the authenticity of the language learning experience. More consideration of the situations and topics—especially what is not addressed across the texts—could influence the estimation of how authentic the texts are.

Findings of Cultural Authenticity in Mandarin Matrix Textbooks

Regarding the cultural authenticity of the K-6 books, a high level of authenticity ranging from 92.42% to 100% was observed in portraying scenarios and behaviors of human characters in the illustrations. These findings challenged the researcher's initial concern that the *Mandarin Matrix*'s illustrations depict a low degree of cultural authenticity. The unexpectedly high level of cultural authenticity prompts consideration of a few possible reasons for these unexpected results.

Traditional Chinese Cultural Elements

The coding process primarily focused on assessing whether the illustrations in *Mandarin Matrix* textbooks depicted everyday experiences of native-Chinese speakers in communication. Most of these illustrations relied on basic, familiar, universal human functions, remaining at the surface and intermediate levels of cultural levels. Surface culture, as described by Al-Najjar (2020), includes elements such as food, holidays, and sports, while intermediate culture involves preferred ways of giving instructions or advice, and expressing promises. However, deep culture, which includes hidden perspectives such as Confucianism, Buddhism, and other traditional philosophical views deeply rooted in Chinese society, was not represented in the illustrations, except in Grade

6 books. This consideration of cultural levels was not explored during the coding process, potentially contributing to the high cultural authenticity reported for communicative interaction in the selected curriculum.

Addressing the issue of deep culture, Peterson (2004) likened it to the "bottom of the iceberg" (p. 25). This type of culture entails invisible aspects within both Big "C" cultures, such as core values, history, and legal foundations, and Little "c" cultures, including popular issues or societal perspectives. Conversely, the "tip of the iceberg" (Peterson, 2004, p. 25) represents visible culture, which includes elements like architecture, classic literature, political figures (Big "C"), as well as gestures, body postures, clothing style, music, and artwork (Little "c"). While these cultural elements are present in the *Mandarin Matrix* books designed for elementary-grade students, they are only superficially represented. Despite the predetermined emphasis on visible culture within the cultural aspect category, the absence of detailed subcategories for identifying cultural elements likely contributed to the overall high estimation of authenticity in the K-6 *Mandarin Matrix* materials.

Diversity of Chinese Cultures

Compared to K-5 books, the Grade 6 books incorporate a greater array of substantial cultural elements, including Chinese classical literature, architecture, history, and political figures. These additions contribute to a more comprehensive understanding of China's cultural heritage. However, the passages and illustrations provide little significant exploration of how these elements shaped the evolution of Chinese culture or contemporary life in China. This underlying issue may be obscured by the overall high

degree of cultural authenticity in the Grade 6 textbooks. Regarding Chinese heritage, ethnicity can be one of the issues influencing the degree of cultural authenticity of illustrated texts. According to Hong and He (2015) and CountryReports (2024a, 2024b, 2024c, 2024d), Han Chinese constitute the predominant population in China (92%), Hong Kong (95%), Macau (95%), and Taiwan (98%). Both China and Taiwan are home to numerous ethnic minority groups. China officially recognizes 55 minority ethnic groups (China Highlights, n.d.; Hong & He, 2015), while Taiwan has 16 recognized indigenous groups (Ministry of the Interior of the Republic of China [Taiwan], 2024). Although these ethnic groups may share aspects of Han Chinese culture, they also maintain distinct cultural practices (Hong & He, 2015). The coded illustrations in the K-6 *Mandarin Matrix* books predominantly reflect Han Chinese culture. Subsequent research could explore the representation of ethnic minority groups in programs used outside of China.

Extent of Authenticity in Settings

A lower degree of authenticity in the *Mandarin Matrix* illustrations was evident in the settings portrayed (ranging from 43.29 % to 60%). This is especially notable in the Grades K-5 books, where the housing styles, surroundings, and decor predominantly align with Western or American culture (Figure 5.1).

Grades K-1 Book Grade 2 Book Grade 3 Book Grade 4 Book Grade 5 Book

As highlighted by the Director of the Utah Chinese DLI program, the *Mandarin Matrix* books introduce cultural elements that resonate with students' daily life experiences. However, this emphasis on familiar cultural references may inadvertently

Figure 5.1

Examples of Grades K-5 Illustrations

neglect the richness of Chinese culture, limiting students' exposure to its breadth and depth. In Grade 6 books, a noticeable shift towards immersing students in Chinese culture is evident. These textbooks introduce students to valued figures from Chinese history, renowned poets, and architectural marvels such as the Great Wall, the Terracotta Army, and the Forbidden City. By incorporating these cultural elements, the *Mandarin Matrix* program provides students with a more holistic perspective of China's rich heritage and historical significance. This integration likely broadens students' understanding of Chinese culture and promotes a deeper appreciation for the cultural legacy that continues to shape Chinese society today. However, it may be beneficial for the Grades K-5 books to introduce some of these cultural elements to students earlier, rather than waiting until Grade 6. It is the latest edition of Grade 6 books that exhibit evidence of incorporating

more authentic cultural elements. Thus, it is plausible that newer editions of texts for lower grades (K-5) will incorporate such cultural elements.

Factors Influencing Teachers' Perceptions Reported in the Survey

Previous research on authenticity of language materials tailored for elementary-school Chinese language learners has been limited (Xian et al., 2012). This study aimed to address this gap by not only evaluating the level of authenticity of the K-6 *Mandarin Matrix* books but also investigating the perspectives of Utah Chinese DLI teachers regarding their usage. In exploring teachers' reported perceptions, it is crucial to consider several possible factors that may have influenced their perspectives. These factors include: (a) teacher training and experience with the *Mandarin Matrix* curriculum; (b) familiarity with alternative teaching materials; (c) personal teaching philosophies and approaches to language instruction; (d) institutional support and resources available for implementation; and (e) cultural and linguistic backgrounds of teachers.

Interpretations of Teachers' Ratings on Likert-Scale Statements

While the sample size restricts any interpretation, the observed trends in the teachers' responses reveal underlying issues within the *Mandarin Matrix* curriculum. Although most teachers agreed that the curriculum serves as a valuable resource for students' Chinese reading ($M = 4.02$), the lowest rating ($M = 2.15$) was for its perceived ability to support students in reading authentic materials outside of classrooms. However, reading authentic texts outside of the classroom presents challenges. Without scaffolded

instruction from experts, students may struggle to understand keywords, complex language structures, and the main ideas in materials intended for native-Chinese speakers (Namaziandost et al., 2022; Shastina et al., 2017). The role of the *Mandarin Matrix* curriculum for elementary-grade students likely serves as introductory materials for Utah Chinese DLI students. To support students in reading more authentic Chinese in middle and high school, greater integration of real-life texts might be required for advanced development.

Responding teachers expressed more reservations about the curriculum's support for listening (M = 3.0) and speaking skills (M = 2.91) compared to writing skills (M = 3.02). This perception may stem from the expectation that a reading program introducing a logographic language would be particularly helpful, while teachers are the primary source for developing listening and speaking skills. In addition, it is noteworthy that teachers expressed fewer reservations about the cultural support (M = 2.98) provided by the *Mandarin Matrix* materials compared to language support (M = 2.69). The possible reasons behind teachers' ratings could indicate a certain degree of appreciation for how the curriculum cultivates students' cultural understanding. With these trends observed in the survey responses, it is critical to acknowledge that a few factors might have influenced the responses of participating teachers' perspectives on the 5-point Likert-scale statements.

Influence of Chinese Cultural Norms

Responding teachers' ratings for the 5-point Likert-scale statements hovered around 3 (M = 2.80), indicating a more modest stance on almost all items. Even though

responses were anonymous, it was conceivable that Chinese teachers reported more neutral stances on many items. This tendency might have been influenced by cultural norms, such as the inclination towards politeness or conservatism when expressing opinions. In Chinese culture, there tends to be a preference for harmony and avoiding confrontation (Chen, 1997; Wei & Li, 2013). Criticizing authority or established systems is not encouraged. Thus, these teachers could have prioritized maintaining a harmonious relationship with State administrators and other stakeholders by giving reserved responses on the survey, yielding rather neutral scores.

Concerns Regarding Professional Repercussions

Participating teachers may have had concerns about the potential repercussions of expressing strong opinions on the *Mandarin Matrix* materials, particularly if these opinions are perceived as negative by state authorities, and whether this might impact their job security. They may have feared unfavorable consequences from their educational institution or superiors if they expressed dissatisfaction with the curriculum. Some of these teachers are on working visas, hoping to apply for permanent residency with approval from their school districts. In their minds, expressing dissenting opinions could jeopardize their employment stability and their opportunity to apply for a Green Card. This contextual factor may have led some teachers to temper their responses, thus contributing to the overall neutrality observed in the ratings.

Chinese Teachers' Various Interpretations for Statements

Although carefully designed, the Likert-scale statements in the survey could have

been interpreted differently by individual teachers. Factors such as their language proficiency, familiarity with the *Mandarin Matrix* materials and other curricula, teaching experiences, and personal beliefs and values all likely played a role in shaping their interpretations. Given that the statements were in English, Chinese teachers with higher proficiency may have comprehended the language more accurately than those with lower proficiency, who may have misinterpreted the intended meanings.

Additionally, teachers' experiences in teaching Mandarin or other subjects, as well as their interactions with students, could have influenced how they perceived the relevance and applicability of the statements to their teaching practices. Certain teachers may have even participated in the development of the *Mandarin Matrix* curriculum, thereby having a deeper understanding of the principles and goals it follows. Any involvement in curriculum editing was not determined in this study, but could have contributed insider knowledge, and potentially influenced their ratings of survey statements. Subsequent research might focus on or isolate the teachers, if any, who worked in the development of the curriculum.

Teachers' Responses to Open-Ended Questions

Some teachers highlighted certain issues regarding the authenticity of texts, such as oversimplification, inauthentic terms, and a less accurate representation of Chinese language structures and culture in the *Mandarin Matrix* materials. However, some variables may have influenced participating teachers' responses in this regard.

Chinese Teachers' Teaching Philosophies and Approaches

Teachers' personal beliefs, values, and teaching philosophies could have colored their interpretation of the statements. For example, teachers who prioritize a communicative approach may place greater emphasis on using authentic texts that reflect real-world language use and cultural contexts. On the other hand, teachers who prioritize students' language skills development may have focused more on the content of stories and the complexity of vocabulary rather than on authenticity.

Familiarity with Alternative Teaching Materials

Teachers' exposure to and familiarity with alternative teaching materials could have also influenced their perceptions of authenticity in the *Mandarin Matrix* materials. Teachers who have experienced different teaching curricula or resources (i.e., *Better Chinese*, *Chinese*, *Chinese Language for Primary Schools*, *My First Chinese Reader*) that the State adopted earlier could be more discerning in identifying areas where the *Mandarin Matrix* materials fall short in helping students acquire Chinese language and culture effectively. Those without such experience might be more positive about the program now adopted for regular use.

Teachers' Standards for Authenticity

Individual teachers may have their own standards for determining the authenticity of texts. Cultural elements, linguistic complexity, and language appropriateness for the target audience can influence teachers' judgments of authenticity. For instance, a Grade 1 teacher might value simple language and relatable cultural contexts for comprehension

and engagement among young learners. A Grade 5 teacher might emphasize more complex language structures and culturally rich content to challenge and expand students' language proficiency and cultural knowledge. The differences in teachers' criteria for authenticity could have led to varied perceptions of the *Mandarin Matrix* materials among respondents.

The responding teachers shared some idiosyncratic and somewhat harsh comments about the *Mandarin Matrix*'s authenticity, showing a discrepancy with the results of content analysis. Holding high expectations for the *Mandarin Matrix* materials could be one reason. However, it could also be that teachers' impressions focused more on idiosyncratic issues with the texts rather than a reasoned evaluation of the *Mandarin Matrix* curriculum in general. The responses could also reflect the negativity bias effect, which refers to the tendency for people, when asked for their opinion, to pay more attention to and give greater weight to negative information or experiences compared to positive ones (Baumeister et al., 2001). This bias could have resulted in a skewed estimation of the program overall.

Chinese Teachers' Proficiency in English Writing

Errors in grammar and vocabulary were extant in some teachers' responses, posing challenges to the comprehensibility of their feedback on the open-ended questions. Teachers who struggle to articulate their thoughts in their L2 clearly may provide vague or ambiguous feedback. If they could have responded in their native language, Chinese, their comments might have been more coherent and clearer, rendering more robust data. It is, therefore, apparent that understanding teacher views of a language

program is a challenging task. These responses shared by the participating teachers, although somewhat ambiguous, suggest important issues for future research consideration.

Recommendations for Future Research

Existing research analyzing FL or L2 textbooks for Chinese learning, particularly focusing on elementary-grade students, has been limited. Of those completed, some have targeted Chinese heritage immigrants (e.g., Chiu, 2011; Sun & Kwon, 2020). There has been a dearth of textbook analysis targeting authenticity for Chinese DLI students, specifically examining the linguistic and cultural authenticity of the *Mandarin Matrix* books. This current study contributes to these two aspects and demonstrates the *Mandarin Matrix* books as providing authentic language and cultural exposure for learners. While this study contributes to the field of Chinese DLI, future research could explore additional avenues to provide further insights and information.

Future research could analyze the complexity of syntax in the *Mandarin Matrix*'s texts. This analysis could investigate the diversity of sentence patterns used throughout the textbooks, as well as the progression of syntactic complexity across different grade levels. Additionally, future research can delve into analysis of the surface, intermediate, and deep cultural elements present in the *Mandarin Matrix* books by examining evidence of specific cultural themes, practices, or beliefs. Researchers could investigate how these cultural elements are integrated into language learning activities in the classroom through observation to understand the influence on students' cultural competence. For example,

in a Grade 6 book, students encounter a classical poem by the renowned Tang dynasty poet Li Bai, “床前明月光, 疑是地上霜, 举头望明月, 低头思故乡 (Trans., By my bed, the bright moonlight; seems like frost upon the ground; raising my head, I gaze at moonlight; lowering my head, I think of my hometown).” Reading this poem, teachers might help students understand that the imagery of the moonlight is frequently used among native-Chinese speakers as symbolism to express feelings of nostalgia or love. With this understanding, students may be able to interpret phrases like “月亮代表我的心 (Trans., The moon represents my heart),” recognizing the moon as a symbol of affection.

Moreover, classroom observations should focus on how teachers utilize the *Mandarin Matrix* books and supplemental resources to support students’ language development. Following observations of teaching practices and the incorporation of supplementary materials, interviews with teachers could provide insights into their strategies for teaching with the *Mandarin Matrix* texts. Based on teachers’ responses in the current survey, findings indicate that teachers generally agree that the *Mandarin Matrix* materials support students’ reading and writing skills. This suggests a potential direction for future research to evaluate the extent to which the *Mandarin Matrix* materials or resources target academic reading and writing skills in comparison with conversation skills. Such research could involve analyzing the distribution of reading and writing tasks across textbooks and worksheets and assessing their alignment with ACTFL’s language proficiency standards. Additionally, classroom observations could demonstrate how teachers deliver these tasks and identify any additional resources used to enhance students’ literacy proficiency.

Analyzing the authenticity of the K-6 *Mandarin Matrix* books in this study has provided an initial understanding of this series as it provides exposure to authentic language and culture. Extending the analysis to include Grades 7 and 8 in future research would further enhance understanding authenticity and its progression throughout the entire *Mandarin Matrix* curriculum. Regarding the comparison of textbooks, future research could also consider comparing the authenticity of *Mandarin Matrix* with other language textbooks. A comparative analysis could identify the strengths and weaknesses of the *Mandarin Matrix* materials in terms of linguistic and cultural authenticity relative to other resources. Finally, exploring students' insights and experiences regarding learning Chinese using the *Mandarin Matrix*, particularly in higher-grade students could be illuminating. Researchers could explore students' preferences for specific tasks or cultural content within the *Mandarin Matrix* books and investigate how these factors influence their learning experiences. Students' perceptions and feedback could be valuable for guiding teachers in implementing effective language instruction strategies and informing future editions of the *Mandarin Matrix* books.

Implications for Instruction

Language textbooks serve dual roles as both "curricular artifacts and a pedagogic genre" (Weninger, 2021, p. 142). The *Mandarin Matrix* materials provided by the State of Utah, including lesson plans, worksheets, and an online platform, are tailored to guide teachers in supporting students' Chinese language learning journey. However, the effectiveness of these materials hinges on teachers' adept utilization. Teachers are central

in fostering students' active engagement with texts, facilitating meaningful language practice, and promoting productive language use even outside of the classroom context. To empower educators in this role, professional development (PD) opportunities can be indispensable. PD can prioritize equipping teachers with strategies to effectively utilize the *Mandarin Matrix* materials. For instance, by exploring the features of the *Mandarin Matrix*'s resources, such as worksheets and the online platform, teachers could enhance their instructional practices. They could learn to adapt worksheets from the *Mandarin Matrix* curriculum in reading or writing activities while concurrently fostering students' listening or speaking skills. Regarding the online platform, teachers should receive training to effectively utilize its interactive elements, multimedia resources, and supplemental materials to enhance students' communicative competence.

Additionally, providing teachers with strategies for teaching texts that integrate high authenticity such as the *Mandarin Matrix* books, could be productive. These strategies could include cognitive approaches and compensation strategies (Oxford, 1990). The cognitive approaches include explicitly teaching students specific vocabulary and sentence structures found in the *Mandarin Matrix*'s texts. Teachers could be trained in techniques like how to teach paraphrasing sentences or paragraphs and analyzing contextual clues to predict the meaning of texts, fostering language comprehension and critical thinking skills. Compensation strategies can be introduced to support students in navigating authentic texts. These strategies include teaching students skills for inferring the meaning of keywords while reading and making inferences from texts. Eventually, these strategies would enable students to apply their skills when engaging with authentic

materials outside of the classroom.

Conclusion of the Discussion

This study, although a small contribution to the field, serves as a pilot for investigating the extent of linguistic and cultural authenticity in the *Mandarin Matrix* textbooks used in elementary-grade Chinese language education. In this study, the content analysis of authenticity in a K-6 serial has evidenced the value as instructional materials for Chinese language learners. Despite initial concerns raised by teachers regarding the authenticity of the materials, the findings revealed high levels of linguistic and cultural authenticity across Grs. K-6. The extensive examination of linguistic elements such as word selection, word order, and situational language usage demonstrated attention to detail in providing authentic language for students. Similarly, the exploration of cultural authenticity uncovered a nuanced portrayal of human scenarios and behaviors in the illustrations, although deeper cultural elements were found to be underrepresented. The study also shed light on the advantages and limitations, as well as usage, of the materials from teachers' survey responses.

Moving forward, future research could delve deeper into the complexity of word meanings, syntax, and the integration of deep cultural elements within the *Mandarin Matrix*'s texts to provide a more comprehensive understanding of the curriculum's authenticity and overall effectiveness. Additionally, exploring teachers' classroom instruction using *Mandarin Matrix* books and gathering students' insights into their experiences with the materials could yield valuable insights for instruction. Ultimately,

this study contributes to educators' understanding of how the *Mandarin Matrix* curriculum fosters authentic language learning, offering valuable insights for the Utah Chinese DLI program teachers as they strive to create influential learning experiences.

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APPENDICES

Appendix A

Teacher Survey in English

Teacher Survey in English

Dear DLI Chinese Teacher,

We are seeking your input on your perceptions and use of the *Mandarin Matrix* curriculum materials via this survey. If you have consented to participate in this study, it means that you have decided to complete the survey. Your opinions about how the *Mandarin Matrix* presents the Chinese language and culture are important and may contribute to the future development of curricular materials. Your input and responses will remain confidential. Your participation is appreciated.

Yours sincerely,
Hsiaomei Tsai
Ph.D. Candidate
Utah State University

Part 1: (Demographic Information)

1. Age
   - 20-30
   - 31-40
   - 41-50
   - 51-60
   - Above 60

2. Ethnicity
   - Asian
   - Asian American
   - Black
   - Hispanic or Latino
   - Hawaiian Native or Pacific Islander
   - Middle Eastern or North African
   - Native American or American Indian
   - White

3. Highest degree earned
   - Bachelor's Degree
   - Master's Degree
   - PhD or EdD

4. Birthplace Country _____

5. If Chinese is not your first language, please briefly
   (1) Describe how have you acquired Chinese?
   (2) Describe how long have you been using Chinese?
   (3) In what contexts do you use Chinese?

6. How long have you taught Chinese? _____ Year(s)

7. How long have you taught Chinese in Utah DLI programs? _____ Year(s)

8. Which grade levels have you taught in Utah Chinese DLI programs?
- Kindergarten
- 1st grade
- 2nd grade
- 3rd grade
- 4th grade
- 5th grade
- 6th grade

Part 2: (Statements) Please consider the following statements. Using a scale of 1 to 5, with 1 indicating LEAST agreement and 5 indicating STRONGEST agreement, estimate how you currently feel about each statement below.

I view the *Mandarin Matrix* textbooks as…

9. Helping students to learn natural Chinese language.
   1 2 3 4 5

10. Supporting students to improve communicative competence with native-speaking Chinese people in real-life contexts.
   1 2 3 4 5

11. Enabling students to improve Chinese listening skills.
   1 2 3 4 5

12. Improving students' Chinese speaking proficiency.
   1 2 3 4 5

13. Offering resources for helping students learn to read in Chinese.
   1 2 3 4 5

14. Enabling students to improve their Chinese writing skills.
   1 2 3 4 5

15. Providing good resources to help students learn vocabulary that they need in social situations.
   1 2 3 4 5

16. Not having many words, phrases, or sentences that are directly translated from English.
   1 2 3 4 5

17. Exposing students to language that native Chinese people normally use regularly in the real-world.
    1 2 3 4 5

18. Supporting students' familiarity with how Chinese people think and speak in real situations.
    1 2 3 4 5

19. Providing useful resources that help students connect their real-life experiences with Chinese culture.
    1 2 3 4 5

20. Promoting cultural understanding that supports reading comprehension.
    1 2 3 4 5

21. Sharing interesting resources for learning Chinese.
    1 2 3 4 5

22. Supporting students in learning Chinese culture.
    1 2 3 4 5

23. Increasing students' intercultural understanding (including the similarities and differences between Chinese and American cultures)
    1 2 3 4 5

24. Enhancing students' learning motivation in different languages.
    1 2 3 4 5

25. Motivating students to do additional Chinese readings and writing outside of the classroom.
    1 2 3 4 5

26. Improving students' Chinese reading comprehension of a variety of materials (e.g., newspapers, magazines, journals, novels, etc.)
    1 2 3 4 5

27. Infusing more natural Chinese language and more Chinese culture across K-6 levels.
    1 2 3 4 5

Part 3: Open-ended Questions. Please write your responses under the column for each question.

1. How frequently do you use the Mandarin Matrix when teaching Chinese?

2. What do you believe to be the advantages of the Mandarin Matrix materials in helping DLI students learn Chinese?

3. What do you believe to be the limitations of using Mandarin Matrix to help DLI students learn Chinese?

4. Which classroom activities do you typically use to teach Mandarin Matrix texts?

Appendix B

Mandarin Matrix's Thematic Categorization of K-6 Textbook Topics

Mandarin Matrix's Thematic Categorization of K-6 Textbook Topics

Themes	Grades K-1 Foundational Level	Grade 2 Novice Low	Grade 3 Novice Mid	Grade 4 Novice High	Grade 5 Intermediate Low	Grade 6 Intermediate Mid	Total
Animals and pets	8	7	1	6	3	0	25
Appearance and characters	0	0	1	1	6	1	9
Beauty and aesthetics	0	0	3	0	0	3	6
Chinese foundation	3	0	0	0	0	0	3
Contemporary life	0	0	1	0	0	2	3
Culture and customs	2	2	4	3	4	12 (44%)	27
Daily activities	0	1	4	2	0	0	7
Experiences	0	2	2	3	13 (33%)	19 (48%)	39
Family	5	8 (16%)	18 (36%)	13 (26%)	6	0	50
Food and dining	0	2	3	3	4	6	18
Global challenges/sharing the planet	1	0	3	3	0	0	7
Health and fitness	0	0	0	0	3	0	3
Hobbies and leisure	5	11 (22%)	11 (22%)	11 (22%)	9	1	48
Home and neighborhood	1	1	4	4	3	0	13
Human ingenuity	0	1	0	0	0	0	1
Identities	3	1	0	0	0	1	5
Jobs and future plans	1	0	0	0	1	0	2
Numbers and dates	13 (81%)	3	0	0	0	0	16
Places and travel, directions	11 (28%)	3	5	5	2	13	39
School	2	6	4	4	10 (33%)	4	30
Shopping	0	0	6	0	2	1	9
Social relationship	1	1	0	0	6	2	
Technology and science	0	1	1	1	3	0	6
Weather and clothing	3	3	3	1	2	0	12

Resources: Mandarin Matrix Limited 2021-2024.

CURRICULUM VITAE

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EDUCATION

2024
Utah State University Logan, Utah
Ph.D. Education
Concentration: Literacy education and leadership, dual language immersion, language literacy.
Dissertation: *An Evaluation of Authenticity: A Content Analysis of K-6 Mandarin Matrix Textbooks for Chinese Dual Language Immersion Programs*

2013
Utah State University Logan, Utah
Master of Second Language Teaching (MSLT)
Coursework in second language acquisition, linguistics, and pedagogical training.

2004
National Taipei University of Education Taipei, Taiwan
Bachelor of Arts
Major in Special Education

TEACHING EXPERIENCE

2016 - Current
Cedar Ridge Elementary School Hyde Park, Utah
5th grade DLI Chinese teacher 2021-Present
1st grade DLI Chinese teacher 2016 - 2021

July 2024
USU StarTalk Chinese Camp Logan, Utah
*Teaching High School students with intermediate-level proficiency in Chinese

2017 – 2019
Working with **Dr. Clayton Brown** Utah State University
Tutoring and Translating for Chinese Mandarin Historical documents

2013 - 2016
Ridgecrest Elementary School Sandy, Utah
1st grade DLI Chinese teacher
June 2013 - July 2013 Provo, Utah

BYU StarTalk Chinese Camp
*Teaching High School Level 2 students
2012 - 2013

Utah State University Logan, Utah
Graduate Instructor
Department of Languages, Philosophy, & Communication Studies
* Teaching CHIN1010/CHIN1020

September 2011 - December 2011
Utah State University Logan, Utah
Teaching Assistant
Department of Languages, Philosophy, & Communication Studies
* Tutored lower division Chinese language learners
* Graded CHIN1010 students' assignments

April 2011 - August 2011
Hwaya kindergarten Taoyuan, Taiwan
After-Class English Teacher
* Guided pre-school students in simple English speaking and reading activities
* Designed materials for conversation, pronunciation, and vocabulary

Chin Hsi Junior High School Taoyuan, Taiwan
Special Education Teacher
* Taught students with learning disabilities
* Designed curriculum and English instruction for students with learning disabilities

2010 - 2011
Chung-Shun Elementary School Taoyuan, Taiwan
Special Education: Unclassified Peripatetic Teacher
* Taught students with special needs in different schools
* Counseled students' parents

2009 - 2010
Baby Development Center Taoyuan, Taiwan
Early Child Special Education Teacher
* Provided life skills training for pre-school students in need of special education
* Designed teaching materials and delivering instruction

2009
Kuei-Shan Elementary School Taoyuan, Taiwan
Special Education Teacher
* Provided life skills training and cognitive behavior instruction for students with special needs

2006 - 2009
Shan Ding Elementary School Taoyuan, Taiwan
Special Education Teacher
* Provided life skills training and cognitive behavior instruction for students with special needs

After-Class English Teacher
* Guided students in basic English speaking and reading activities
* Designed materials for conversation, pronunciation, and vocabulary

2005 - 2006
Nan Xing Elementary School Taoyuan, Taiwan

Special Education Teacher
* Taught students with learning disabilities

2004 - 2005
Dong Men Elementary School Taoyuan, Taiwan
Intern Teacher
* Helped teachers instruct exceptional students with different special needs

2003 - 2005
Private tutor Taipei/Taoyuan, Taiwan
*Taught a moderately cognitive impaired student

LICENSES & CERTIFICATIONS

2021
Issued by the Utah State Office of Education U.S.A.
Utah Professional Educator License
Dual Immersion Endorsement
World Language Endorsement: Chinese
ESL Endorsement

2020
Issued by Yonsei University Korea
First Step Koren * Credential ID: QX3VCFFVGKNF
https://www.coursera.org/account/accomplishments/certificate/QX3VCFFVGKNF

2020
Issued by Yale University U.S.A.
The Science of Well-Being Certificate * Credential ID: E9WFU4CH2EK7
https://www.coursera.org/account/accomplishments/certificate/E9WFU4CH2EK7

2016
Issued by the Utah State Board of Education U.S.A.
Utah Teaching License (For Cache County School District)
* License Level 1: LEA-Specific License, Competency Based
* License Area: Secondary Ed (6-12) with World Language Endorsements: Chinese

2014
Issued by the Utah State Office of Education U.S.A.
Utah Teaching License (For Canyons School District)
* License Level 1: LEA-Specific License, Competency Based
* License Area: Secondary Ed (6-12) with World Language Endorsements: Chinese

2005
Issued by the Bureau of Education Taiwan
Teacher Certification
* Elementary School: General Education
* Elementary School Special Education for special-needs and gifted students

2006
Issued by YAMAHA Foundation Taiwan
Piano Grade7 Certificate

BOOK & BOOK CHAPTER

Sung, K. Y., & Tsai, H. M. (2019). *Mandarin Chinese dual language immersion programs.*
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http://multilingual matters.com/results.asp?sf1=ctitle%2Ccontributor&sort=sort_date%2Fd&st1=Mandarin+Chinese+Dual+Language+Immersion+Programs+

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Mohr, K. A., Downs, J. D., Chou, P., & **Tsai, H.** (2023). Using read-alouds to teach inferencing from the start. *Early Childhood Education Journal, 51*(3), 419-429. Doi:10.1007/s10643-022-013118

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Sung, K. Y., & **Tsai, H. M.** (2014). Motivation and learner variables: Group differences in college foreign language learners' motivations. *International Journal of Research Studies in Language Learning, 3*(2), 43-54.

Sung, K. Y., & **Tsai, H. M.** (2014). Investigating students' needs in a Chinese language program. *GSTF International Journal on Education (JEd) 1*(2), 47-54.

CONFERENCES

Tsai, H-M. (2022, February). "A Pragmatic-focused analysis of requests and their politeness in Chinese dual language immersion (DLI) textbooks." *Annual Conference of the National Association for Bilingual Education (NABE),* New York City, NY.

Tsai, H-M. (2021, October). "A Comparative analysis of cultural and situational authenticity in Chinese dual language immersion textbooks." *Northern Rocky Mountain Education Research Association (NRMERA),* Sun Valley, ID.

Sung, K-Y. **& Tsai, H-M.** (2019, November). "Teaching Chinese characters in a sixth Grade dual language classroom." *Annual Convention and World Languages Expo (ACTFL),* Washington, D.C.

Sung, K-Y. **& Tsai, H-M.** (2019, March). "Exploring Chinese dual language immersion teachers' identities." *American Association for Applied Linguistics (AAAL),* Atlanta, GA.

Sung, K-Y. **& Tsai, H-M.** (2018, November). "Creating an effective and supportive dual language classroom." *Annual Convention and World Languages Expo (ACTFL),* New Orleans, LA.

Sung, K-Y. **& Tsai, H-M.** (2018, November). "Oral feedback and subsequent learner responses in a dual language classroom." *Annual Convention and World Languages Expo (ACTFL),* New Orleans, LA.

Sung, K-Y. **& Tsai, H-M.** (2018, October). "Translanguaging: A documentation of how emergent bilinguals use translanguaging in their daily communication." *Linguistic Association of the Southwest (LASSO),* Provo, UT.

Sung, K-Y. **& Tsai, H-M.** (2017, October). "Chinese language learning and teaching strategies in a dual language class." *International Forum on Linguistics and Chinese Education (IFOLCE-3),* Notre Dame, IN.

Sung, K-Y. **& Tsai, H-M.** (2017, October). Chinese-Character Instruction in a Chinese Dual Language Immersion Program." *International Forum on Linguistics and Chinese Education (IFOLCE-3),* Notre Dame, IN.

Sung, K-Y. **& Tsai, H-M.** (2017, March). "Chinese-character instruction in a Chinese dual language immersion program." *American Association Applied Linguistics (AAAL),* Portland, OR.

Sung, K-Y. **& Tsai, H-M.** (2014, March). "Exploring learner errors, teacher's corrective feedback (CF), learner uptake and repair, and learners' preference of CF." *American Association Applied Linguistics (AAAL),* Portland, OR.

Sung, K-Y. **& Tsai, H-M.** (2014, November). "Investigating students' needs in a Chinese language program." *Annual Convention and World Languages Expo (ACTFL),* San Antonio, TX.

Tsai, H-M. (2012, October). "How English/Chinese bilingual children develop their biliteracy ability?" *Intermountain TESOL (I-TESOL),* Orem, UT.

Tsai, H-M. (2012, June). "Literacy development in two languages: Chinese-English bilingual children" *Lackstrom Linguistics Symposium,* Utah State University, Logan, UT.

Tsai, H-M. (2012, April). "Developing Literacy in Two Languages Simultaneously: Chinese-English Bilingual Children" *Student Research Symposium,* Utah State University, Logan, UT.

AWARDS & PRIZES

2019, Cache County School District
Hats Off Award

2018, Center for Open Educational Resources and Language Learning (COERLL)
Language OER Network badge (OER Creator Badge)
https://community.coerll.utexas.edu/
(The Badge is for Lesson Plan that is published for Foreign Languages and the Literary in the Everyday: Teaching Texts in the L2 Classroom. http://fllite.org/category/chinese/)
2017, Cache County School District
Hats Off Award

2017, Arizona University
Scholarship for the CERCLL summer workshops and thank your interest in the Foreign Languages and the Literary in the Everyday Project.

2012, Utah State University
Graduate Instructor of the Year Nominee

2009, Taiwan
Second Place
* Self-made Teaching Materials and Aids Group in 2009 Special Education Teaching Materials and Aids Contest

2006, Taiwan
Third Place
***** Self-made Teaching Materials and Aids Group in 2006 Special Education Teaching Materials and Aids Contest

2006, Taiwan
Excellence Award
* 2006 Annual Special Education Evaluation

2006, Taiwan
First Place
* Chinese Language Competition in Social Sciences Group

SPECIAL TRAINING

2013 - Present
Semi-annual Utah State Chinese Dual Immersion Teacher Training

June 6-9, 2017
Foreign Languages and the Literary in the Everyday: Teaching Texts in the L2 Classroom

June 18-22, 2012
StarTalk Chinese Immersion Teacher Training Park City, Utah

October 4, 2006
Dale Carnegie Training Taoyuan, Taiwan
Held by Hong Da Foundation

April 6, 2006
Taoyuan County Government Taoyuan, Taiwan
* Teaching strategies for ADHD Students
* Cognitive Training

VOLUNTEER EXPERIENCE

2007 - Current
Serving in the **Church of Jesus Christ of Latter-day Saints**
* Relief Society teacher
* Pianist
* Primary teacher

* Sunday School teacher
* Young Woman second counselor

2004 - 2005
Min-Sheng Hospital Taoyuan, Taiwan
* Provided Sensory Coordination Training to exceptional students

September 6, 2003
Child Development Fun Fair Taipei, Taiwan
Held by Taipei Child Development Center
* Helped special needs students to develop their gross motor skills and social skills.

January 20 ~22, 2002
Winter Camp Taipei, Taiwan
Held by Taipei Association of Learning Disabilities
* Helped special needs students to develop their gross motor skills and social skills.

2016~2018
Private tutoring Utah
* Weekly CFL sessions with adult language learners

LANGUAGES

English (advanced); Chinese Mandarin (native speaker); Taiwanese (native speaker)