AGE-APPROPRIATE EARLY LITERACY LEARNING ACTIVITIES FOR CHINESE IMMERSION KINDERGARTEN CLASSES

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By

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Abstract

This study and project focuses on creating age-appropriate early literacy activities for Chinese Immersion kindergarten classes. It provides an overview of the history of immersion education in the United States and its growth in the past few decades. Included are also many national initiatives that accelerated the increase of awareness and interests in critical need languages, with special focus on Chinese. The challenges of current immersion education curricula, materials, teacher recruit, and teacher bur-out rate are discussed. The literacy activities in this project are based on research of Chinese literacy development stages and significant predictors of reading outcomes. These reading and writing activities can be used with whole class, small groups, or for individual practice. The materials are designed for the teacher in the classroom as well as for students and parents to review and practice at home. The reading activities address character-level naming speed and text-level reading fluency, both are crucial in reading development. The writing activities utilize large visuals and allow young learners to incorporate age-appropriate materials to learn Chinese characters through play. These materials and activities are designed as templates for practicing teachers to manipulate and extend to meet program specific needs. The project hopes to relieve some of the burdens in planning and lesson preparation for current teachers. Feedback from the teacher and the responses from students who have used the materials are included in the final discussion for future design modification.

Keywords: Chinese immersion, Chinese literacy development, significant predictors in reading Chinese, age-appropriate learning activities, Chinese character naming speed, learn Chinese characters through play, Chinese reading fluency, Chinese literacy activity templates.

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Table of Contents

Title Page i

Abstract ii

Acknowledgment iii

Table of Contents iv

Table of Tables x

Preface xi

Overview of this Study and Project xiv

Chapter 1 Background 16

1.1 Purpose of this Study and Project 16

1.2 Chapter Overview 16

1.3 Brief History of Bilingual Education in Canada and in the U.S. 17

1.3.1 Canadian French-English Bilingual Program Success 17

1.3.2 U. S. Bilingual Program in Miami, Florida 18

1.4 Benefit of Learning Additional Languages 18

1.4.1 Cognitive Advantages 18

1.4.2. Social Skills 19

1.5 What is Language Immersion Education? 19

1.5.1 Definitions of Key Terms 19

1.5.2 Instruction in Immersion Program 21

1.5.3 Growing Interests of Immersion Education in the United States 21

1.5.4 Growth in Chinese Immersion Programs in the United States 21

1.6 National Initiatives in Promoting Foreign Language Learning 22

1.6.1 Foreign Language Assistance Program (FLAP). 23

1.6.2 Flagship Program 23

1.6.3 National Security Language Initiative for Youth (NSLI-Y) 24

1.6.4 STARTALK 24

1.6.5 Presidential Initiative in Mandarin Chinese Learning

– 100,000 Strong and 1Million Strong 25

1.7 Anchorage School District (ASD) Immersion Programs Overview 26

1.7.1 Different Immersion Programs in ASD 26

1.7.2 STARTLK and ASD's Chinese FLES Program 26

1.8 Problems and Challenges for Immersion Programs 29

1.8.1 Teacher Recruiting 29

1.8.2 Teacher Development 29

1.8.3 Teacher Retention 30

1.8.4 Challenges in Finding Appropriate Immersion Curricula 30

1.8.5 Limited Assessments for Younger Students in Immersion Programs 31

1.9 Specific Challenges for Chinese Immersion Programs 32

1.9.1 Lack of Reading Materials Designed for Immersion Learners 32

1.9.2 Difficulty in Learning to Write Chinese Characters 33

1.10 Chapter Conclusion 34

Chapter 2 Review of Literature 36

2.1 Chapter Overview 36

2.2 Introduction to Chinese 37

2.2.1 Spoken Chinese 37

2.2.2 Written Chinese 37

2.2.2.1 Characters 38

2.2.2.2 Strokes 38

2.2.2.3 Radical, Simple Character, and Compound Character 39

2.2.2.4 Character Complexity and Character Learning Expectation in China 40

2.2.3 Phonetic Notation in Beginning Literacy Instruction 41

2.3 Developmental Phases/Stages in Learning to Read 43

2.3.1 Learning to Read in Alphabetic Languages 43

2.3.2 Learning to Read in Chinese 44

2.3.2.1 Visual Stage 44

2.3.2.2 Phonetic Stage 46

2.3.2.3 Orthographic Stage 48

2.4. Factors Predicting Literacy Success in Learning to Read Chinese 48

2.4.1 Visual Skills 49

2.4.2 Rapid Automatized Naming (RAN) 50

2.4.3 Morphological Awareness 54

2.4.4 Orthographic Skills 58

2.5 Instruction for Emergent Literacy Skills 61

2.6 Effective Materials for Language Learners 62

2.7 Core Components and Effective Model for Chinese Reading Instruction 63

2.8 Chapter Conclusion 64

Chapter 3 Process 66

3.1 Chapter Overview 66

3.2 Challenge in Meeting Required Time for Selected Language Arts Curriculum 67

3.3 Specific Adjustments Made in our Program 68

3.4 Age-appropriate Early Literacy Learning Activities 69

3.4.1 Characters Learning Activities 69

3.4.1.1 Character Flash Cards and Activities 70

3.4.1.2 Character Introduction Worksheets and Activities 71

3.4.1.3 Handwriting Booklet 75

3.4.2 Reading Activities 78

3.4.2.1 Character Naming Fluency Probes 78

3.4.2.2 Sentences and Short Texts Reading Activities 79

3.5 Chapter Conclusion 80

Chapter 4 Findings 82

4.1 Chapter Overview 82

4.2 Findings 84

4.2.1 Character Flash Cards 85

4.2.2 Handwriting Booklets 86

4.2.3 Short Texts 88

4.2.4 Challenges 89

4.3 Chapter Conclusion 91

Chapter 5 Conclusion 93

5.1 Chapter Overview 93

5.2 Adjustments and Modifications for Future Use 93

5.2.1 Character Flash Cards 94

5.2.2 Handwriting Booklets 95

5.2.3 Short Texts 96

5.3 School and Home Connection 97

5.4 Activity Collection for Future Teachers 98

5.5 Digital Learning in the Future 99

5.6 Alternative Assessments and Learning Portfolios 100

5.7 Final Conclusion 101

5.8 Personal Reflection and Future Direction 103

References 105

Appendices 115

Appendix A: Anchorage School District Chinese Program Implementation Timeline ..115

Appendix B: Chinese Characters & Connected Text Samples 116

Appendix C: A Schematic Summary of the Approximate Relationships between Different Stage/Phase Theories of Learning to Read (Ehri, 2005) 117

Appendix D: Summary of the Experiments by Anderson et al. (2013) Learning to See the Patterns in Chinese Characters 118

Appendix E: Chinese Character Introduction Worksheet 119

Appendix F: Suggested Activities for Character Introduction Worksheets 120

Appendix G: 20 Basic Stroke Types 121

Appendix H: Directions for Handwriting Practice Booklet 122

Appendix I: Handwriting Booklet Sample Pages 123

Appendix J: Character Mastery Record Page in Handwriting Booklet 124

Appendix K: Character Naming Practice Sample Probes 125

Appendix L: Suggested Activities for Sentence and Short Texts 126

Appendix M: Short Text Sample Activities 127

Appendix N: Character Review Activities for Whole Class 128

Contact Information 129

Table of Tables

Table 1 Definitions of Key Terms	20
Table 2 Anchorage School District Immersion Programs and Schools	27
Table 3 Numbers of Characters Learned & Visual Complexity by Grades	41
Table 4 Samples of Visually Similar Characters	50
Table 5 Character Flash Cards and Suggested Uses	71
Table 6 Numbers of Characters Learned & Visual Complexity by Grades	74

Preface

Learning English at age twelve opened up a whole new world for me. The formations of letters and the unfamiliar sounds excited me so that I practiced reading aloud constantly. A red pocket English-Chinese dictionary became my favorite item to carry wherever I went. My fascination over the language and cultural differences lead my father to believe that I might be possessed! How could I not become so involved in the new world I have discovered through the learning of a new language?

I continued learning languages through college and graduated with a major in German and a minor in English. I had limited opportunities to use German after graduation but began teaching private English classes. Later, I decided to pursue a graduate degree in Teaching English to Speakers of Other Languages (TESOL) and arrived in the U. S in 1990.

Fast forward to 1996, I became involved in teaching Mandarin Chinese when I moved to Anchorage, Alaska. I taught beginning conversational Chinese to about 15 local families who had just adopted their children from China. These parents were determined to keep their children connected to their Chinese heritage through the learning of Mandarin Chinese. As the kids grew, we focused less on the interests of the parents and added more songs, crafts, and simple cooking for the children. These home classes stopped when I began working for the Anchorage School District (ASD) in 2003.

Many of these parents with adopted children from China have heard about the success of ASD's Japanese Immersion Program that started in1989. These parents began organizing meetings and hoped to establish a Mandarin immersion program through the implementation model adapted for the Japanese Immersion Program. With the enthusiasm of these parents and interests from community members, the ASD School Board finally approved the proposal in the

spring of 2006. The Chinese FLES Program (Foreign Language in Elementary School) began at Scenic Park Elementary in 2007-2008 school year to increase the awareness and the interests in the community. In the Chinese FLES Program, students received two 30-minute sessions of instruction in Chinese language and culture. The development of ASD's Chinese Program K-12 from 2006-2017 is summarized in Appendix A.

While the ASD elementary Chinese Program remained as FLES only, the interests of learning Mandarin Chinese has increased tremendously at the national level. From only one immersion school in the whole country in 1981, to 71 programs in 2011, and finally more than 200 schools in 2016-2017 school year (Center for Applied Linguistic, 2011; Weiss, 2016).

The Office of the Director of National Intelligence (ODNI) launched STARTALK in 2006 (National Foreign Language Center, 2017). Even though Office of DNI's capacity is not related to education but to integrate foreign, military and domestic intelligence of the U. S., it identified the need of foreign languages important role in the political and intelligence field. STARTALK focuses on critical-need languages which are of economic and/or political importance. STARTALK's main objectives are to increase public interests, numbers of teachers and learners of these critical languages, and to expand effective learning with high quality of curricula and materials. Mandarin Chinese is one of the identified languages and has held the largest numbers of programs since the inception of STARTALK. ASD has been continuingly awarded STARTALK grant to run a summer camp since 2011. STARTALK annual conferences have provided ASD Chinese teachers professional development opportunities for effective planning and engaging strategies over the years and helped lay the foundation for the Chinese immersion program.

I have worked in the ASD STARTALK summer program for 5 years from 2011 to 2015. Through professional development provided by STARTALK conferences and the ASD, I was selected to serve as the Chinese immersion teaching specialist in 2015. This study and project became my personal journey in understanding the Chinese literacy development and allowed me to create innovative early literacy activities. The ASD Chinese program has chosen to teach the writing in simplified Chinese characters. Unless specified, the script referred in this study is mostly simplified Chinese characters instead of traditional Chinese characters.

Overview of this Study and Project

The goals for this study and project are to create age-appropriate early literacy learning activities for Chinese immersion kindergarten classes. The components of the work will focus on the following:

1. Summarize the history of immersion education in the United States and the national initiatives that helped accelerated the recent growth in immersion programs with some challenging issues immersion programs are facing,
2. Provide fundamental background information in Chinese literacy development, including factors that predict success in naming Chinese characters and reading fluency,
3. Provide literacy activity designs that are based on these research findings,
4. Provide activity templates to facilitate early literacy development in immersion kindergarten classroom.

Chapter One focuses on the history of immersion education, together with many initiative at the national level. Problems and challenges for implementing effective immersion programs are included and discussed. Specific challenging issues for Chinese immersion programs are highlighted.

Chapter Two includes related literature from the past two decades. It summarizes literacy development both in alphabetic languages and in Chinese. It then provides some research-based predictors for Chinese reading success at both the character-level and text-level. Effective instruction for emerging literacy skills, materials, and core components for Chinese reading instructions are included as the foundation of the project design in Chapter 3.

Chapter Three will present my personal designs of writing and reading activities based on the research included in this study. The activities are suitable for practicing teachers as well as for students and parents. Suggested use of these literacy activities and some templates will be included in this chapter. A complete list and details of activities are not included but can be shared upon request.

Chapter Four will discuss findings from activities already being used in the Chinese Immersion kindergarten classes in the ASD.

Chapter Five will include my reflections on the design process and chart out possible future directions in revising and expanding my current study and project.

Chapter 1 Background

1.1 Purpose of this Study and Project

The purpose of this study and project is to provide new to Chinese immersion kindergarten classroom teachers an overview of the history and development in immersion education and the current challenges administrators and classroom teachers often encounter. The research included in this study focuses on essential background knowledge in Chinese literacy development to assist teachers in curriculum planning. Furthermore, this project aims to provide literacy activity designs that are grounded in research. The ultimate goal is to have activity templates for teachers to use in their classrooms. This study and project can be summarized as the following:

1. Summarize the history of immersion education in the United States and the national initiatives that helped accelerated the recent growth in immersion programs with some challenging issues immersion programs are facing,
2. Provide fundamental background information in Chinese literacy development, including factors that predict success in naming Chinese characters and reading fluency,
3. Provide literacy activity designs that are based on these research findings,
4. Provide activity templates to facilitate early literacy development in immersion kindergarten classroom.

1.2 Chapter Overview

In the past two decades, immersion programs have been a fast-growing trend in education field. It is important to look into the history of bilingual education and the many benefits it brings forth to understand the current boom of immersion programs. Recent national initiatives

such as Flagship Programs and STARTALK have assisted in the professional development of language teachers and have accelerated the awareness and growth of language programs. However, various challenges remain in establishing and maintaining quality immersion programs.

1.3 Brief History of Bilingual Education in Canada and the U.S.

With new immersion programs opening all over the country, it is almost impossible to keep an accurate count at any given time. A look at the early bilingual programs, both in Canada and in the United States with the benefit of learning additional languages will provide some explanations of the phenomenal growth of immersion programs.

1.3.1 Canadian French-English bilingual program success.

In the 1960s, a group of English-speaking parents in St. Lambert, Canada, raised serious concern about their children learning French through the traditional second language learning method. These parents believed that the traditional method was insufficient in helping students achieve the level of proficiency to compete with the students from French-speaking families. This prompted the experiment in bilingual education in 1965 conducted by Lambert and Tucker. Students in kindergarten and first grade were instructed in French only during the school day and English was only taught as a subject for short periods of time starting in second grade. The students progressed accordingly in both languages and their academic growth measured by standardized tests showed equivalent or higher achievement in both languages when compared to students instructed only in French (Lambert & Tucker 1972). These students performed at or above grade level in English compared to peers instructed in English only. Their proficiency in French met target goals and their speaking native-like. The students in this experiment came

from similar home language backgrounds and were all learning French at the same time. This learning model is later referred to as one-way immersion.

1.3.2 U.S. Bilingual program in Florida.

Bilingual programs started in the United States under different circumstances and with different instruction models. In 1963, due to the large number of immigrant families from Cuba flooding into Miami, FL, Coral Way Elementary School began providing instruction in Spanish to maintain the language learning and cultural connection for these Cuban families. The school had included students from different home language backgrounds, both Spanish and English. These students were combined into same classrooms and instructed in both Spanish and English during the school day. This was not meant to be a permanent solution but has grown to be a successful bilingual and bicultural education program for speakers of English and Spanish in the community. Coral Way's success has influenced the national legislation in bilingual education and has provided positive learning evidences in pedagogy for later programs around the U.S. (Everett-Haynes, 2008; Pellerano, Fradd, Rovira, & National Clearinghouse for Bilingual Education, 1998). Students in this bilingual program came from two different home language backgrounds and are learning each other's language and experiencing each other's culture. This model is later referred to as "two-way immersion".

1.4 Benefits of Learning Additional Languages

There are benefits in learning additional languages whether the learning takes place at an earlier or later age. These benefits can be grouped into two broad categories.

1.4.1 Cognitive advantages.

Genesee has stated that dual language education is a feasible and effective form of education (Genesee, 2008). Much research has been conducted to show added benefits for

students in immersion programs including not only the higher language proficiency and ability to speak in a native-like manner but also additional cognitive advantages in the areas of cognitive flexibility, meta linguistic knowledge, selective attention, greater executive control, and enhanced problem solving ability (Bialystok, 1999; Bialystok, 2011; CARLA, 2014; Lindholm-Leary, 2001).

In a recent study of children (N=72) ages ranging from four to six, Fan et al. concluded that the bilingual children demonstrated enhanced communication skills over monolingual children. The bilingual children were also more attuned to the perspective of the speakers they interacted with (Fan, Liberman, Keysar, & Kinzler, 2015).

1.4.2 Social skills.

Learning a foreign language also improves one's cultural competence and the tolerance of ambiguity (Thomson, 2016), which are important skills for the constant and increasing communication with people from other language and cultural backgrounds. Cultural competence is a crucial part of social intelligence that shapes one's thinking and behavior when interacting with people from other cultures. In this day and age of globalization, better cultural competence can help increase communication efficiency, reduce unnecessary confusion, and even avoid possible conflicts due to cultural misunderstanding.

1.5 What is Language Immersion Education?

1.5.1 Definitions of key terms.

With the growing interest in language immersion education, it is important to understand what immersion education really provides. From the early bilingual programs in the 60's, some of the terminologies used have gradually changed over time. The definitions of terms used in this study and project are provided here for clarification purpose and for consistency. The main

language for instruction referred besides the immersion language is English as my project is specifically about immersion education in the United States. Table 1 provides definitions derived from Center for Advanced Research on Language Acquisition (CARLA, 2016).

Table 1

Definitions of Key Terms

Key Term	Definition
L1	The first language or sometimes the home language of learners
L2	The second language of learners
FL	Foreign language, a language that is generally not spoken in the immediate environment of the learners.
TL	Target language, the language that the students are learning in a particular program
IL	The target language of an immersion program
One-way immersion (foreign language immersion)	The students in the program do not speak the immersion language. These students might have different L1 but mostly they speak the language spoken by the majority in their community. The students are all beginners in learning the immersion language.
Two-way immersion (dual language immersion)	About half of the students in the program speak the immersion language as L1. The IL is the students' dominant language. The other half of the students speak English as L1(or sometimes other L1). English is their dominant language. The ideal ratio for students from both languages is 1:1 but it is sometimes hard to maintain the exact ratio. It is essential to have a minimum of one third of the students from one of the language groups.
Partial immersion or 50/50 model	About 50% of the instructional time is in the immersion language. The immersion teacher uses only the immersion language during the allotted instructional time.
Total immersion or 90/10 model	About 90% of the instruction time is in the immersion language. In this type of program, music, PE, and library classes are usually not taught in English. Students do not have any instruction in English until later grades. English is usually added as a subject starting in 2nd grade and gradually increase later grade level until it reaches 50% of the instructional time.

1.5.2 Instruction in an immersion program.

In an immersion program, the instruction is clearly separated by the use of languages. The immersion approach uses only the target language (immersion language) during instruction to teach the contents of the subjects assigned in their respective programs. They rely on various strategies to make the content comprehensible from the very start. Initial reactions from the students can vary from extreme excitement to reluctance in participation. Usually, after a few weeks, the students are able to follow simple directions in IL and participate in activities. Depending on the model, students might go to a different room for English instruction. They may stay in the same classroom if English instruction is taught as a subject.

1.5.3 Growing interests of immersion education in the United States.

Due to Since the success of the aforementioned bilingual programs in Canada and in the U.S., the concept of using additional languages as the medium for instruction has been adopted and developed into different types of immersion programs. The languages used for instruction also expanded from French-English and Spanish-English to various combinations. According to the directory and data by Center for Applied Linguistics (CAL), immersion programs in the U. S. has grown from 3 programs in 1971 to 448 programs in 2011. The majorities of these programs listed are Spanish (45%) and French (22%). Mandarin programs ranked third (13%) with 71 programs on the list (CAL, 2011a; CAL, 2011b; CAL, 2011d).

1.5.4 Growth in Chinese immersion programs in the United States.

Mandarin Chinese has gained its popularity due to China's increasing importance in the global economy and politics. The oldest Chinese immersion school, Chinese American International School (CAIS), opened in 1981 in San Francisco, CA. According to the Mandarin Immersion Parents Council's website (https://miparentscouncil.org/), the number of Chinese

immersion programs has since grown to 233 in early 2017 (Weise, 2015). Several recent posts on the same website announced many new programs scheduled to open in the fall of 2017. Many school districts are also considering adding Chinese immersion programs in the near future due to the high interests from parents and their community.

1.6 National Initiatives in Promoting Foreign Language Learning

The ultimate goal of education is to prepare students to be career-ready and become contributing community members when they graduate. Business leaders and education experts have created *Framework for 21st Century Learning* to define the skills and essential knowledge needed for success not only in workforce but also as good global citizens. Language skills and the ability to function appropriately in different cultural settings are critical parts of this framework. Learning additional languages is no longer a requirement for graduation but has become an essential skill in the 21st Century learning (P21 Partnership for 21st Century Learning, n.d.). The increasing interest in immersion education is the product of this awareness.

However, traditional foreign language learning has not yielded the desired proficiency to use the languages in real-world communication. Many national initiatives have been launched to increase the learning results and to promote the interests of learning critical-need languages from an earlier age. The intent is to help student achieve professional-level proficiency.

The shift and changes in the demand of foreign languages in the workforce must be conveyed to students and parents (P21 Partnership for 21st Century Learning, n.d.). Special learning opportunities that can be easily incorporated into their academic experiences are often under promoted. The following national initiatives have existed for decades but are not always known to even world language educators. Mandarin Chinese has been included in all of the programs listed below. These educational initiatives have laid the foundation in preparing more

qualified teachers for the current demand in different language programs, both world language classrooms and immersion programs.

1.6.1 Foreign Language Assistance Program (FLAP).

The U.S. Congress passed the Foreign Language Assistance Act in 1988 and began funding Foreign Language Assistance Program (FLAP) for foreign languages to be taught in elementary and secondary schools. Even though FLAP grants concluded in the fiscal year of 2012, it had already improved foreign language programs in many schools and the necessary professional development for language teachers (U.S. Department of Education, n.d.). Many elementary schools were able to start their foreign language programs through this grant. The FLAP programs included Foreign Language Exploratory programs (FLEX), Foreign Language in the Elementary School (FLES), immersion, two-way immersion, heritage learner language program, and secondary advanced placement coursework.

1.6.2 Flagship Program.

In 1991, National Security Education Program (NSEP) was added to U.S. Department of Defense to develop the partnership between the national security community and higher education in addressing the needs of experts with professional-level proficiency in many critical languages and in-depth knowledge of different regions. A key component of the NSEP was the Language Flagship. This federally-funded program focused on combined issues related to national security and federal workforce requirements that demand high proficiency in foreign languages. The Flagship grants started in 2002 with Chinese, Korean, Arabic, and Russian as chosen languages. These programs were designed for post-baccalaureate students only but were extended to undergraduate programs in 2006. Later, the Flagship grants extended as K-12 Initiatives to include elementary, middle, and high schools (The Language Flagship, 2013). The

Flagship universities work to support K-12 language programs in curriculum development in order to improve overall learning outcomes. Students from these programs will enter college with advanced proficiency and will continue pursuing other professional studies through these languages. There are currently 27 Flagship Centers around the U.S. and the languages include Arabic, Chinese, Hindi-Urdu, Korean, Persian, Portuguese, Russian, Swahili, and Turkish. Students who have graduated from these programs achieve professional-level proficiency with additional majors in business, education, STEM, and social science fields (The Language Flagship, 2014).

1.6.3 National Security Language Initiative for Youth (NSLI-Y).

In 2006, the U.S. Department of State launched the National Security Language Initiative for Youth (NSLI-Y) to provide merit-based scholarships for high school students to participate in summer programs overseas. Only Chinese and Arabic was included in the first three years. Current programs include learning in Arabic, Chinese, Hindi, Korean, Persian (Tajiki), Russian, and Turkish. Instead of the original short-term summer programs only, new programs extended to include academic year. The estimated number of students participated from 2006 to date (2016-2017) will be around 5,000 (National Security Language Initiative for Youth, n.d.). NSLI-Y's main goal is to foster life-long language learning as well as to increase learners' cultural competency.

1.6.4 STARTALK.

The Office of the Director of National Intelligence (ODNI) launched STARTALK in 2006 to increase both the number of learners and teachers in critical need foreign languages. The critical need foreign languages included in this grant are Arabic, Chinese, Dari, Hindi, Korea, Persian, Portuguese, Russian, Swahili, Turkish, and Urdu (National Foreign Language Center,

2017). The STARTALK grant provides students free and fun summer camp experiences to spark the interest in language learning. It also provides teachers with training in effective curriculum planning and effective lesson delivery. The goals of STARTALK are to encourage and promote more students in lifelong languages learning, equip language teachers with interactive strategies through learner-centered practices. Through better teaching and learning of these languages, U.S. will be able to improve its international relations through speakers with advanced proficiency and cultural competency. Consequently, the overall national security of the United States can benefit from the results and more U.S. businesses can compete in the global market.

1.6.5 Presidential Initiative in Mandarin Chinese Learning - 100,000 Strong and 1 Million Strong.

With China's increasing political importance and its influence in global economy, President Obama launched 100,000 Strong Initiative in 2009 to increase the numbers of Americans to learn Mandarin Chinese. In 2013, the Secretary of State, Hillary Clinton, established the 100,000 Strong Foundation to continue the mission and interests in promoting the learning of Mandarin Chinese at all levels with focus in study abroad in China. The goal of 100,000 Americans learning Mandarin by 2014 was surpassed and 1 Million Strong Initiative was announced in 2015.

> . . . the goal of 1 Million Strong is to grow the next generation of leaders who have a deeper understanding of China by creating a pipeline of China-savvy employees in a range of critical industries, and ensuring that US students from all backgrounds have the opportunity to gain China-related skills (US-China Strong, n.d.).

The new goal set in 2015 is to increase the current number of about 200,000 American students learning Mandarin Chinese to one million by the year 2020. The initiative involves not only curriculum planning and support but also teacher training and use of technology.

1.7 Anchorage School District Immersion Programs Overview

1.7.1 Different immersion programs in ASD.

The Anchorage School District (ASD) has successfully implemented six immersion programs since 1989. Currently, ASD has Spanish, Russian, and German programs ranging from grades K-12 in various schools. Details about different ASD's immersion programs and the schools they are housed in are included in Table 2 (on page 27). These immersion programs are a strand in a public school except for the German program which is a public charter school with grades K-8. The German immersion students will continue in an ASD public high school after Grade 8. The

All of the ASD immersion elementary programs follow the 50/50 model. Students spend a half day in the immersion classroom and the other half in English classroom. Subjects taught in the immersion classroom are language arts, social studies, and science. All the other non-core instructions including arts, health, music, physical education, and library, are taught in English.

1.7.2 STARTALK and ASD's Chinese FLES Program.

ASD's FLES program received its first STARTALK grant for a two-week summer camp in 2011. The first summer camp accommodated 50+ students from grades K-5. ASD has been continuously awarded the grant every year since 2011. The summer camp has expanded to 80 students and included students from middle school. The STARTALK summer camp also hires high school students currently taking Chinese elective classes as junior counselors. STARTALK has aided ASD in creating a supportive community for learning Chinese.

Table 2

Anchorage School District Immersion Programs and Schools

School	Year Established	Grades	Instruction Model
Japanese Program			
Sand Lake Elementary	1989	Grades K-6 strand in a school	50/50 one way language arts, social studies, & science
Mears Middle School		Grades 7-8	2 periods - language arts & social studies
Dimond High School		Grades 9-12	1 period - language & content combined
Spanish Program One Way			
Chugiak Elementary	1992	Grades K-5 strand in a school	50/50 one way language arts, social studies, & science
Mirror Lake Middle School		Grades 6-8	2 periods - language arts & social studies
Chugiak High School		Grades 9-12	1 period - language & content combined
Spanish Program Two Way			
Government Hill Elementary	1993	Grades K-6 strand in a school	50/50 one way language arts, social studies, & science
Romig Middle School		Grades 7-8	2 periods - language arts & social studies
West High School		Grades 9-12	1 period - language & content combined
Russian Program			
Turnagain Elementary	2004	Grades K-6 strand in a school	50/50 one way language arts, social studies, & science
Romig Middle School		Grades 7-8	2 periods - language arts & social studies
West High School		Grades 9-12	1 period - language & content combined
German Program			
Rilke Schule German Charter School of Arts & Science	2007	whole school Grades K-8	Grade K-6 50/50 one way language arts, social studies, & science G7-8 2 periods - language arts & social studies
Service High School		Grades 9-12	
Chinese Program			
Scenic Park	2016	elementary K-5 strand in a school	50/50 one way language arts, social studies, & science
Begich Middle School	not yet	Grades 6-8	2 periods - language arts & social studies
Bartlett High School	not yet	Grades 9-12	1 period - language & content combined

Part of the STARTALK grant includes the program director and instructional lead teacher to attend its annual pre- and post- conferences. Professional development sessions are offered at the conference to improve both the curriculum design and effectiveness of instruction for different ages and proficiency levels. These conferences also provide teachers opportunities to share their success and exchange ideas for thematic planning and cultural activities. The STARTALK program director in the ASD program has always been the principal at Scenic Park Elementary. The current principal has been supportive to include all the ASD's Chinese teachers in attending conferences. These Chinese teachers teach at different levels including elementary, middle school and high school. Attending the conferences help strengthen the teamwork between these teachers and allow them to become familiar with backward design and incorporate proficiency guidelines and Can-do Statement created by American Council on the Teaching of Foreign Languages (ACTFL) for planning effective learning episodes with formative and summative assessments in all three modes of communication. STARTALK has provided the needed tools for the teachers while ASD's budget crisis persisted. The success of learning outcome after students participated in the two-week immersion-like program has laid the groundwork in increasing the awareness and interests in the community.

At last, in the spring of 2015, the ASD School Board accepted the proposal to move forward with the Chinese immersion implementation. With budget issues still looming, the FLES program was reassessed and the instructional time was reduced. The reduction in FLES instructional time allowed the Chinese FLES teacher time to begin the curriculum preparation. The FLES program now focuses on maintaining the cultural awareness and interests of the students. The students will be able to participate in Chinese elective classes in middle school with better cultural understanding.

1.8 Common Challenges for Immersion Programs

1.8.1 Teacher recruitment.

The immediate challenge for implementing any immersion program is finding qualified teachers. Immersion teachers are usually native speakers of the IL or those with near-native proficiency if they have been raised in a non-immersion language environment. They must have proper teaching credentials to meet the state and district hiring requirements. Most school districts prefer hiring teachers from their native countries but do not have means to sponsor in obtaining working visa. The visa application process is also time consuming and expensive.

1.8.2 Teacher development.

Some immersion teachers have earned their teaching credentials in the U.S. or have equivalent certification from their home countries, but their teacher training programs are not necessarily geared toward immersion-specific curriculum planning and teaching (Tedick, Christian, & Fortune, 2011). These immersion teachers teaching at the primary level may not be familiar with the fundamental literacy development stages. At the upper grade levels, many teachers are often not equipped to meet both the content and the linguistic demands in designing their lessons (Fortune, Tedick, & Walker, 2008). Many teachers also come from learning environments that are different and stricter than most American school settings. These teachers have difficulty in designing and delivering lessons that are student-centered with hands-on activities preferred in the U.S. Disciplinary issues and communication with parents can also be difficult for teachers who are not familiar with the general expectation. Many teachers are hired with temporary status and are given limited time to finish the required credentials. There are not enough resources to adequately prepare new-to-immersion and new-to-the-country immersion teachers (Asia Society, 2012).

1.8.3 Teacher retention.

It takes tremendous planning for an immersion classroom teacher to create units and lessons that are content based with rich language focuses that meet state and district standards. The immersion teachers are often the only educators teaching their grade level or even multiple grades in some schools. Collaboration is hard and the articulation of the program is a daunting task if time is not allotted for the teachers in the program to collaborate. Additional support from a curriculum coordinator or experts in immersion education is important to produce coherent and quality curricula (Tedick, Christian, & Fortune, 2011). Usually, the teacher burnout rate is higher compared to regular classrooms due to the demand of the teaching and planning.

1.8.4 Challenges in finding appropriate immersion curricula.

Even with such high interest in immersion programs and with hundreds of programs established, the curricula and materials available are still limited. Many current materials available are designed for world language classroom instruction not geared toward the immersion classroom needs. These materials are often arranged with learning experiences according to themes and functions of the language with focus on communication skills in general. Materials that are age-appropriate for developing language skills and for learning contents in academic subjects at elementary level are scarce. Immersion programs aim to develop language skills through age-appropriate academic contents while foster communication skills similar to real-life settings. Most immersion teachers result to create their own units and lessons to meet their curriculum requirements. Directly translated curricula often risk to include vocabulary and language structures beyond the age and abilities of the students (Shrestha, 2015; Tedick, Christian, & Fortune, 2011). The goal for meeting biliteracy standards could easily be stated as “lost in translation”.

1.8.5 Limited assessments for younger students in immersion programs.

There are two types of assessments to assist teachers in making instructional decisions. Summative assessments provide data points such as end of the unit, theme, or end of the year. Teachers use these data to compare students' progress to the norm of standards or benchmarks to evaluate whether students are making necessary progress for their accumulated learning over time. Formative assessments are ongoing and less formal measures that teachers use to monitor whether students are making progress during learning process. Formative assessments are timely feedback for teachers to adjust their teaching for desired results.

Students in immersion programs are required to take the state mandated summative assessments conducted in English. These mandate summative assessments in English are usually for students in grades 3 and up. There are also summative assessments in the immersion languages to document the progress in immersion language proficiency. The STAndards-based Measurement of Proficiency (STAMP) is a computer-based, norm-referenced assessment for students grades 3 -12. STAMP results provide norm for comparison. The data is based on the student pool participating in the test.

The Center for Applied Linguistics (CAL) has many assessments available, such as Early Language Listening and Oral Proficiency Assessment (ELLOPA) for grades K-2; Student Oral Proficiency Assessment (SOPA) for grades 2-8; and CAL Oral Proficiency Exam (COPE) for grades 5-8 (CAL, 2017). These assessments are interactive activities designed to assess students in pairs and generally are time consuming and require additional training to conducting and scoring interviews. Besides the training cost and the time needed for assessment, the rating can be subjective. These factors combined with teacher retention challenge, many schools are hesitant to use these assessments.

Formative assessments throughout the year become the sole measures to document progress. Formative assessments data can be collected in many forms depending on the intention and goals of the teacher. Tollefson, Bacon, Ennis, Falsgraf, and Rhodes (2012) have listed 1) daily quizzes; 2) student projects; 3) observation checklist of "can do statements"; 4) integrated performance assessments; 5) LinguaFolio self-evaluation. These assessments are informative but lack comparison with a larger pool of learners and can be inconsistent and less objective across grade levels.

1.9 Specific Challenges for Chinese Immersion Programs

1.9.1 Lack of reading materials designed for immersion learners.

The increase in learning Chinese since 1990s have prompted the growing volumes of Chinese reading materials in all subject areas and levels to meet the demand. Even though abundant reading materials are available on the market, many of them are translated from existing books originally written in other languages. The language complexity levels of these books vary widely as some books are written for adults to share with children.

In English reading materials, there are many systems used to index the complexity levels to guide teachers, parents, and even students in choosing books for independent reading purpose (King & Lavadenz, 2015). The work on providing a reference scale to determining levels of difficulty in Chinese texts is just in its infancy stage. King and Lavadenz (2015) worked with a team of Chinese teaching experts and many participating schools has begun the work under a STARTALK grant and have completed a Chinese high frequency word band. It is now available online through Mandarin Institute's Website (http://www.mandarininstitute.org/K-5%20WFD). The Word Frequency Dictionary (WFD) can be a powerful tool for teachers to begin sorting their current collections of reading materials for their students. However, finding time to determine

readability levels adds more strain to the already demanding planning for immersion teachers. Level Chinese is a paid resource providing references about difficulty levels of reading materials. Besides the leveled book lists, the service also includes mastery-based assessments, and data-driven lessons for teachers (Level Chinese, 2017). Weise (2014) stated that reading materials that immersion students could read independently seemed mostly "childish" because these books are not written for students in immersion programs who are developing language skills while they have higher cognitive abilities for more challenging contents.

1.9.2 Difficulty in learning to write Chinese characters.

Learning to write Chinese characters is difficult even for native Chinese children let alone for students who are learning the different contents and Mandarin Chinese as a foreign language at the same time in an immersion classroom. More about the unique aspects of the Chinese language, both spoken and written are include in the literature review in Chapter 2.

In general, decoding and pronouncing Chinese characters are unlike the learning of alphabetic languages. Beginners need to have learned some basic "simple characters" that are also phonetic "radicals" to be able to decode compound characters in later learning. The task of learning how different types of "strokes" are positioned to form characters is complex and laborious. The order of all the strokes is stressed in the writing process. Native Chinese students do not necessarily all follow the correct stroke orders when practice writing even though worksheets often include the stroke sequences. For students in immersion programs, stroke orders are additional details they must attend to and thus often become ignored, though not always intentionally, during the handwriting practice.

The traditional method for native Chinese children is to repeatedly copy and write the character until the characters are committed to long-term memory (Hanley, 2005, Shu, 2003).

This traditional learning method does not produce desirable results for students in immersion programs in the United States (Weise, 2014). Teachers, students, and parents are all in agreement that handwriting newly-learned characters is the least favorite aspect of learning Chinese.

1.10 Chapter Conclusion

This study and project as summarized at the beginning of this chapter is to achieve the following goals.

1. Summarize the history of immersion education in the United States and the national initiatives that helped accelerated the recent growth in immersion programs with some challenging issues immersion programs are facing,
2. Provide fundamental background information in Chinese literacy development, including factors that predict success in naming Chinese characters and reading fluency,
3. Provide literacy activity designs that are based on these research findings,
4. Provide activity templates to facilitate early literacy development in immersion kindergarten classroom.

This chapter focuses on the history of immersion education, with brief summaries of many initiatives at the national level. It is crucial for immersion teachers to become familiar with the development of the immersion education in the United States and the resources that are available. Problems and challenges for implementing effective immersion programs are also important for both practicing and prospect teachers besides the curricula. The understanding of challenges helps teachers understand important factors in policy making and provide perspectives in effective communication with administrators. Several specific challenging issues

for Chinese immersion programs are highlighted to prepare teachers during their planning and teaching.

Chapter 2 Review of Literature

2.1 Chapter Overview

The purpose of this study and project is to develop early literacy activities in writing and reading for kindergarteners in immersion classroom setting in the United States. The main goals are:

1. Summarize the history of immersion education in the United States and the national initiatives that helped accelerated the recent growth in immersion programs with some challenging issues immersion programs are facing,
2. Provide fundamental background information in Chinese literacy development, including factors that predict success in naming Chinese characters and reading fluency,
3. Provide literacy activity designs that are based on these research findings,
4. Provide activity templates to facilitate early literacy development in immersion kindergarten classroom.

The literature review in this chapter will begin with information about Chinese language, both spoken and written, as it is a language unlike any alphabetic languages. There are more than one writing system and countless spoken variations in the "Chinese language". After the general information about Chinese language, the developmental stages/phases of learning to read alphabetic languages and learning to read Chinese are summarized. Several research publications about the factors and indicators for predicting Chinese literacy are discussed after the reading development. The chapter concludes with some instruction strategies, effective materials, and instructional model for young learners. Due to the volumes and extensive research about the nature of reading development and instructional strategies, selecting relevant

and concise information is not an easy task. Only the most relevant information is included to provide the necessary background for the application in my design of age-appropriate activities for this study and project.

2.2 Introduction to Chinese

2.2.1 Spoken Chinese.

Chinese is not just a single language but a collective term that includes two current writing systems and many spoken variations shared by all the Chinese people living in China, Taiwan, many southeastern Asian countries, and around the world. Linguists call all the different spoken variations of Chinese as "dialects". The number of major dialect groups varies between seven or more. Within each major dialect group, there are numerous sub-dialects (Bolotnikov, n.d.). Even though these spoken variations are all called dialects but the majority of them are not mutually intelligible. They are classified as Chinese dialects because they share the same script. Mandarin Chinese has only been established as "official dialect" since the 1930s. The republican government established in 1911 selected the Beijing dialect (Mandarin Chinese) as the standard dialect to addressed the communication inefficiency of speaking in different dialects. Mandarin Chinese has since been called the common language (pǔtōnghuà) in China, national language (guóyǔ) in Taiwan, and Chinese language (huáyǔ) in most south Asian countries.

2.2.2 Written Chinese.

In addition to the complexity surrounding the many Chinese dialects, Chinese writing has evolved from different forms over thousands of years into the two modern writing systems, the simplified form and the traditional form. Simplified Chinese is used in China and Singapore. Traditional Chinese is used in Taiwan, Hong Kong and the Philippines. In Chan's *Statistic on*

the Strokes of Present Day Chinese Script (1982), approximately 2,000 characters have been reduced to simpler forms since 1956, and the mean of Chinese simplified characters has been reduced from 11.2 to 9.0 of equivalent traditional characters (as cited by Hanley, 2005). Since most of the characters in both writing systems remain the same, people who have learned to read one script can easily become fluent in reading the other with additional training. In other words, the knowledge is transferable.

2.2.2.1 Characters.

Chinese is a non-alphabetic language. The smallest written unit is a character. A character is also an individual syllable in spoken Chinese. The characters have their own meaning or sometimes multiple meanings when they stand alone. Chinese words (vocabulary) can be a single character or formed by combining two or multiple characters. Vocabulary words with multiple characters are not necessary representations of the combined meanings of the characters within. For example, the two characters 小 xiǎo (small) and 人 rén (person), each has their own meaning. However, when combined together, 小人 does not mean a small-sized person. Instead, the meaning of the word can refer to a sneaky person or a villain depending on the context it is used.

2.2.2.2 Strokes.

Chinese characters are approximately similar in size when written or printed. Seemingly, the characters are contained within an imaginary square. In a connected text, there are no spaces between different characters. The different shapes and lengths of lines within a character are called strokes. A stroke is the smallest unit within a Chinese character. There are eight basic strokes that shape differently (Shu, Chen, Anderson, Wu, & Xuan, 2003). The character 永 yǒng (forever) has been traditionally used as an example that contains all eight basic strokes (, ,

). Many references and resources about strokes and writing rules have included more strokes. Chan's work includes 12 different stroke types (Chan, 1982, as cited by Hanley, 2005). There are 32 stroke types listed in the *Better Immersion* teacher's resource (a language arts curriculum published in the U. S.). The combinations of the basic 8 strokes extend to the 12 or 32 stroke types. Some of the strokes are longer and some shorter. Most strokes resemble straight lines but some are slightly curved. The shortest stroke looks like an elongated "dot". Some of the longer strokes change orientation once or more times. The simplest characters consist of only one stroke. The most difficult character has 64 strokes. Appendix B includes samples of Chinese characters with different complexity and a sample of a short text. Appendix G displays 20 different stoke types used in my design of handwriting materials. The total number of strokes used to compose a character is regarded as the index of the character's visual complexity.

2.2.2.3 Radical, simple character, and compound character.

Beyond the strokes as the smallest component of characters, some strokes combined to form bigger components called radicals. Radicals have semantic and phonetic properties and can provide useful but limited information for decoding unfamiliar characters for inexperienced readers. All characters can be divided into two major types, simple characters and compound characters. Simple characters cannot be further broken down into smaller subcomponents. Compound characters are composed of at least two or more subcomponents. Most compound characters have one semantic radical and one phonetic component. Regular characters share the same phonetic components have the same pronunciation, semi-regular characters have similar pronunciation, and irregular characters have completely unrelated pronunciations (Shu et al. 2003).

2.2.2.4 Character complexity and character learning expectation in China.

Shu et al. (2003) analyzed all the characters included from the 12 volumes of the Elementary School Textbooks prepared by the Ministry of Education in China. The textbook set is used in many regions around the country. The corpus of the characters from these textbooks contains 2,570 distinct characters. Elementary teachers (from 1st grade through 6th grade) are required to teach these characters explicitly. Chinese students diligently learn to read texts containing these characters and are expected to write all of them from memory (Hanley, 2005; Shu et al., 2003) by the time they complete elementary education. Shu et al. have titled their study "School Chinese" because it is the first comprehensive analysis of characters exclusively from learning materials used at elementary level. This study provides a foundation for understanding the scope and sequence of children's acquisition in reading and writing characters. After students finish learning these characters, they should be able to read and comprehend most of the texts they encounter later in life (Shu et al., 2003, Hanley, 2005).

Shu et al. categorize the characters into different types and provided the proportion and distribution of character types learned in different grades. Earlier grades have more characters to learn than higher grades as the focus of learning gradually shifts to reading comprehension. The characters learned in first grade has the lowest mean strokes (7.37), much lower than all other grades. More characters of fewer strokes are taught in earlier grades and the complexity of characters increase as the students become more capable in writing Chinese characters. Table 3 displays the numbers of characters learned in each grade and the average visual complexity of the characters from that grade. The information is summarized from the Properties of School Chinse by Shu et al. (2003). The number of characters is not in a linear progression (Shu et al, 2003).

Table 3

Numbers of Characters Learned & Visual Complexity by Grades

Grade	1	2	3	4	5	6	Total
Number of characters	436	709	541	458	323	203	2,570
1-6 strokes	45%	20%	15%	10%	7%	11%	19%
7-12 strokes	48%	65%	68%	67%	68%	64%	63%
13-24 strokes	7%	15%	18%	23%	25%	26%	18%
Mean strokes	7.37	9.22	9.80	10.29	10.57	10.56	9.45

2.2.3 Phonetic notation in beginning literacy instruction.

Chinese characters provide very limited information about pronunciation thus learning to read Chinese characters is not an easy task even for native learners. There have been different phonetic notation methods used to represent the pronunciations of Chinese characters. The two main systems used for native Chinese students are Pinyin and Zhu Yin Fu Hao. Students in Taiwan are taught Zhu Yin Fu Hao, which consists of symbols not related to any Chinese characters. Students in China are taught Pinyin. Pinyin uses the same English alphabet to represent Chinese phonemes. Despite the differences in the two phonetic notation systems, the purpose remains the same as to aid the learning of characters for beginner readers (Henley, 2005). Students typically spend the first 10 weeks of school to master Zhu Yin Fu Hao in Taiwan and 12 weeks to learn Pinyin in China. Pinyin and Zhu Yin Fu Hao are especially helpful in the writing process when students can only write limited characters. The spelling in Zhu Yin Fu Hao or Pinyin can help students record their thoughts as long as they can express the ideas orally.

Both Pinyin and Zhu Yin Fu Hao prove to be very beneficial to both Chinese L1 and L2 learning. It provides a pathway, especially to beginning readers, to pronounce unknown characters. Both representations include onset, rime, and the tone of a character. It is a more reliable way to learn the exact pronunciation of unknown characters better than phonetic radical present in characters (Shu et al, 2003). Lin et al. (2010) conducted a study to examine the use of Pinyin and later reading outcome by analyzing invented Pinyin spelling of young native Mandarin-speaking Children in their 3rd year of kindergarten (average age 77 months). The participating children were tested twice within a twelve-month interval. The results revealed that kindergartener's early proficiency in invented correlates with later success in Time 2 Chinese reading (r= .44). As a result, Pinyin has often been included for instruction in Chinese as a foreign language.

Despite the proven benefit of Pinyin for native Chinese beginning readers, Chinese Immersion Programs in the U.S. generally do not teach Pinyin or Zhu Yin Fu Hao when students first begin learning Chinese characters. Most immersion programs in the U.S. do not choose to use Zhu Yin Fu Hao as learning these notation symbols is an extra burden to students when other literacy skills are already overwhelming. The Pinyin system uses the same alphabet but the sounds some alphabet represents are different and some combinations of letters and the phonemes they represent are absent in English, it is thought to be possibly confusing for beginning readers of English. Pinyin is introduced at a later time in most Chinese immersion programs to avoid possible initial confusion. Some teachers choose to incorporate Pinyin later in kindergarten when students have learned the alphabet and the correlated sounds. Most programs delay the use of Pinyin to first grade or even as late as third grade. Pinyin is essential when

typing Chinese characters on a computer. It is more efficient and easier for students to learn Pinyin input method than other available choices (Lin et al., 2010).

2.3 Developmental Phases/Stages in Learning to Read

2.3.1 Learning to read in alphabetic languages.

Many theories and models such as Chall (1983), Ehri (1998) Frith (1985), and Mason (1980) have been proposed to explain the nature of how young children learn to read, especially reading in alphabetic language (as cited by Ehri, 2005). The summary table (see Appendix C) compiled by Ehri (2005) displays these theories and models at a galnce. Ehri states that the term "stage" implies a stricter view that particular skills are learned as prerequisite and are mastered in each stage before the readers proceed to the following stage. Ehri explains that "phrase" highlights predominant skills in the reading acquisition process while other skills can be at a lesser developed state. Readers use the developing skills as strategies with the predominant skills interchangeably during each phase. The overlapping of several skills is common but not always the same from reader to reader in early reading development. Furthermore, many of the earlier phases are natural skills that occur by default and mastery is achieved over time. This universal development is evident in Ehri's summary of different reading development theories and models.

From Ehri's synopsis of different theories (2005), beginning readers of alphabetic languages display similar development characteristics despite different terms are used these models. Children begin noticing the print in their environment and rely on selective features of the script to identify and memorize frequently seen words. These words are not necessarily simple or short words they can decode. These words are often encountered in the immediate environment and daily routine, such as names, schedule, etc. Emerging awareness and

knowledge of the relationship between letters and sounds lead to aide them in recognizing more words when they receive more structured learning in school setting. With increasing knowledge of letters and sound, children continue their effort in learning to read. Even after the learners have mastered the alphabet and letter sounds, it still takes time to achieve mastery during this "alphabetic stage". Over the course of several years, the beginning readers develop mastery of various strategies for reading more complicate words. The process of development from beginning readers to fluent readers requires many years with instruction and practice. Finally, with increasing orthographic knowledge, the readers become competent and fluent in reading (Ehri, 2005).

2.3.2 Learning to read in Chinese.

Despite the differences in orthography between English and Chinese, Chinese beginning readers experience similar developmental stages/phrases in learning to read Chinese (Chen, 2004; Wong, 2013). A model proposed by Chen (2004) includes three stages in the Chinese reading development. The three stages are visual stage, phonetic stage, and orthographic stage. Chen conducted different studies to validate his hypotheses of the model.

2.3.2.1 Visual stage.

In the visual stage, children use self-selected and more distinctive features within a character to help them remember the character. The recall of the character at a later time is not always dependable especially when similar characters are presented at the same time. Chen's study subjects included both Chinese and English beginning readers in preschools. The Chinese students were from Guilin, China (N=40, mean age 48.5 months) and English speaking children were from Champaign, Illinois (N=28, mean age 49 months). The finding concludes that both groups of learners demonstrate reliance of visual features in learning new words or characters.

These children were of similar age and were native speakers of Chinese and English. The Chinese children at the beginning of the study had higher reading skills in average than the English group which was consisted of all nonreaders. The Chinese children ranged from non-reader to ability in reading more than 20 characters. The average reading was 8.21 characters at the beginning of the study. These children were taught respectively 3 sets of Chinese characters or English words for later comparison. The characters/words in the distinctive set had exaggerated visual features. The normal set had real characters/words. The similar set had pairs of characters/words that were visually similar. Both pseudo characters and real words were used in these tasks. Both groups of children had better results in the distinctive set than the normal set, and the lowest for the similar set. It seemed that children in both groups used similar strategies in the tasks. Despite the differences in the Chinese and English orthography, the beginning stage of reading rely solely on distinctive visual features may be universal between the two languages (Chen 2004).

The Chinese children were further divided into sub groups depending on their reading abilities. Their performances in three sets followed similar pattern even though the more experienced group outperformed the less experienced. The strategies used were "nearly identical" (Chen, 2004, p.30). Chen concluded that Chinese children used the same strategies despite the differences in reading abilities. The Chinese children had higher reading skills at the beginning of the study but their gain after the learning task was less when compared to their English counter parts. The slower learning trajectory is proof that Chinese beginner readers stay in the visual stage longer than their English counterparts because they need more time to acquire the skills to process Chinese characters. The Chinese children continue to rely on distinctive stroke shapes for a longer period of time before the skills from next stage begin to emerge.

2.3.2.2. Phonetic stage.

From the analyses of School Chinese by Shu et al. (2003), 72% of Chinese characters in the elementary textbooks are phonetic compound characters. The phonetic radical in the phonetic compounds can be used in learning to read unfamiliar characters. The two phonological strategies used in learning to read Chinese are phonetic strategy and analogy strategy. The phonetic Strategy is using a known phonetic to read other unfamiliar character that shares the same phonetic components. However, characters with the same phonetics can be divided into regular, semi-regular, and irregular characters. Regular characters have the same pronunciation and irregular characters' pronunciations deviate from the phonetic radical in. Due to the unpredictable consistency phonetic radicals, the phonetic strategy is not always reliable to accurately pronounce unfamiliar characters if the characters are not phonetically regular (Anderson, Li, Ku, Shu, & Wu, 2003; Ho & Bryant, 1997). However, the strategy can be effective in assisting learners in remembering new learned characters with familiar phonetic radicals. It is easier to take notice of what the differences lies (onset, rime, tone, etc.) instead of learning completely unrelated pronunciations. Even incomplete phonetic information can still help children in reading new characters.

Chinese children also begin making analogies by using phonetic radicals to help them read unfamiliar characters. The analogy strategy is reading an unfamiliar character by comparing the phonetic radical to any known character or characters that share the same phonetic radicals (Ho, Wong, & Chan, 1999).

Chen (2004) studied two different groups of school age children from China, kindergarteners (N=36) and second graders (N=33), and compared their use of strategies in reading Chinese characters to examine the development sequence of the phonetic strategy and

the analogy strategy. Three types of tasks were administered in this study. The first was a learning and transferring task, the second a matching task, and the last an interview with the children when the children explained their decisions in reading the test characters in the two previous tasks. The results from Chen's study revealed that majority of the kindergarten age children were already aware of the function of the phonetics in the phonetic-semantic compound characters. They understood some types of connection existed when characters shared visual similarity. There was no distinct evidence of which strategy was more prominent at this age. For the kindergarten children who still did not understand the phonetic connection within characters, they used visual similarity (any stroke shapes or subcomponents) between the characters for their choices of pronunciations. These students still remained at the visual stage of learning to read Chinese characters. All the second-grade students were able to explain the strategies they used in the reading and matching task. They were aware of both strategies and could use both competently. Chen concluded that both phonological strategies developed early and simultaneously. Beginning readers seemed to favor and rely more on the phonetic strategy more than the analogy strategy.

Even though the phonetic strategy and analogy strategy develop early in the beginning reading stage, many challenges remain for the Chinese beginning readers. Beginning readers must acquire knowledge of simple characters that are phonetics in compound characters. From the analysis by Shu et al. (2003), students learn more simple characters in the early grades and a smaller portion of the characters in these grades are semantic-phonetic compound characters. Students are learning more single characters as foundation to use them for later decoding. There are limited opportunities to practice and use the phonological strategies in the early grades.

However, the percentage of characters can be read through analogy strategy increase from 35% in first grade to 67% at the end of 6th grade (Shu et al., 2003; Chen, 2004).

The Chinese characters that share a same phonetic radical are called a member of the phonetic "family". According to Shu et al. (2003), there are 563 character families in the primary school textbooks. There are roughly 3 characters in each character family. Even though the characters in each family increased slightly with grade level but the consistency (changes in pronunciations) decreases. It requires additional explicit learning and practice for learners to be able to predict the pronunciation of characters within the same phonetic family.

2.3.2.3. Orthographic stage.

As Chinese children advance from beginning reader to more experienced reader, they also begin to notice the similarities of characters within the phonetic families. The ability to use analogy strategy continue to develop. This ability to use phonological information in more sophisticated manner demonstrates the learner's understanding of the characters and phonetic radicals is deepening. The students begin to use more advanced orthographic strategy to read unfamiliar characters with this accumulated knowledge of phonetic families. In using the character consistency information, children continue to learn and develop more advanced skills in reading unfamiliar characters (Chen 2004). The ability to read more semi-consistent families increases with the children's growing knowledge. Critical character knowledge of the orthographic stage includes the ability to identify the phonetics and its position within characters.

2.4 Factors Predicting Literacy Success in Learning to Read Chinese

Much research and studies in the past two decades have examined crucial skills, which are markers or predictors of reading success in reading Chinese characters. Since this study and project focus on the early literacy development and activity designs for immersion kindergarten

classroom use, the literature review will focus more on skills for character reading and writing at the very beginning literacy development.

Despite the orthographic differences between Chinese and English, children experience similar early literacy developmental stages. The "Big Five" identified by The National Reading Panel (2000) include phonemic awareness, phonics, vocabulary, fluency, and reading comprehension as crucial factors in English reading success. They are the core components that affect literacy outcome in early years through elementary grades. Chinese script is non-alphabetic and the pronunciations of characters are not by combining and blending the sounds of the subcomponents within the characters like most alphabetic languages, the skills essential to learning to read and write are different from those for learning to read English. Many studies and research publications involving Chinese children in China, Hong Kong, and Taiwan have indicated that visual skill, rapid automatized naming (RAN), morphological awareness, and orthographic skills are strong markers and indicators for reading success (Ho et al., 2011; Lei et al., 2011; McBride & Wang 2015; Shu, McBride-Chang, Wu, & Liu, 2006; Tong et al., 2011; Yeung et al., 2011).

2.4.1 Visual skills.

Chen (2004) in his investigation and proposal of a reading development model for Chinese readers, stated that Chinese beginner readers spent more time in the visual stage than their American counter part in learning to read in English. Many Chinese characters are visually similar. The subtle difference between these characters can be the length of a particular stroke or an additional "dot" or stroke that is present/absent. Table 4 has listed a few examples of characters that are visually similar. The difference between the two characters in Set 1 is Character 2 has a longer stroke than Character 1. The difference in Set 2 is Character 2 has an

additional “dot”. Set 3 and Set 4 has three Characters that vary in stroke length and stroke number. The difference between Character 2 and Character 3 in Set 4 are the hardest one to detect as they have the exact number of strokes. Character 3 has a shorter horizontal stroke on the top and a shorter one under it. Character 4 has the same two strokes in reverse position.

Table 4

Examples of Visually Similar Characters

	Character 1	Character 2	Character 3
Set 1	天 tiān (sky)	夫 fū (husband)	
Set 2	大 dà (big)	太 tài (too);	
Set 3	午 wǔ (afternoon)	牛 niú (cattle)	生 shēng (birth)
Set 4	木 mù (wood)	未 wèi (not yet)	末 mò (end)

In the process of decoding, beginner readers must have the visual skill to differentiate subtle differences of characters that are similar (Ding, Richman, Yang, & Guo, 2010; McBride & Wang, 2015; McBride-Chang, Shu, Zhou, Wat, & Wagner, 2003; Shu et al.,2003). Misidentification of a character for another visually similar one can result to confusion or even incomprehensibility. Ding et al. (2010) concluded in their study of Grade 1 to Grade 5 students (N=243) from China that the ability to identify simple characters uniquely contribute to the recognition of more complicated compound characters consist of these simple characters in later reading.

2.4.2 Rapid automatized naming (RAN).

The Rapid Automatized Naming (RAN) tests are tasks that measure how fast an individual can name familiar stimuli such as colors, digits, alphabet, objects, etc. It is a cognitive

skill which involves coordinating attention perception, lexical access, and motor control during the process of the naming task. RAN originated in Geschwind and Fusillo's study of stroke patients in 1966 (Denckla & Cutting, 1999). Early naming task used only five primary colors repeated randomly ten times. Colors were chosen as they were learned early and frequently used in daily life and could be administered to children of young ages without much difficulty.

There are two formats of RAN, discrete and continuous, that vary in the presentation of tested items and the scoring. In the discrete format, the items are presented individually. The result is the average of the latencies of the 50 items. The continuous format displays the 50 items on a board and the score is the total time for the test subject to complete naming all items.

In the 1970s, several of Denckla and Rudel's findings helped establish RAN as a predictor for reading. Other later studies were able to duplicate and extend Denckla and Rudel's findings (Denckla & Cutting, 1999). Kirby et al. (2010) explained why RAN is related to reading as following:

> **. . .** All of these share the view that naming speed and reading are similar both requiring that the eyes move sequentially across the page, that the stimulus in fixation be encoded and access its mental representation, and that the associated instructions for naming the stimulus be activated. Before the first stimulus is fully articulated, the eyes must move on to the next stimulus, and so on, just as in reading, the eyes must sweep back to the beginning to the next line (p.343).

Georgiou, Parrila, & Kirby (2006) examined many studies about the two main components of RAN, articulation time and pause time. They concluded that different analysis methods and the tasks employed contributed to the conflicting results of previous studies. Their study partitioned the RAN performances into different components in order to examine and

isolate the most significant components and skills in reading acquisition. The final samples in this study included 62 students with a mean age of 66.8 months. The tasks administered included RAN- Colors (RAN-C), RAN-Letters (RAN-L), word and non-word reading, and also reading fluency. The tasks were given three times, kindergarten in the spring, first grade in the fall and again in the spring. The RAN responses were digitally recorded and the articulation and pause times were measured to the milliseconds for analysis. The results of this study suggest the times for RAN tasks decreases during the first years of schooling with the change in pause time but minimal differences in the articulation time. Pause time is concluded as key component in predicting reading ability during the first years of school. Furthermore, it is the best predictor for both reading accuracy and fluency measures. Essentially, the tasks measure the same skill. In a later study by Georgiou, Parrila, & Liao (2008) fourth grade English, Greek and Chinese-Speaking students (N=40) were tested individually in in RAN-C, RAN-Digit, word reading, and reading fluency in April/May. No statistically significant difference was found in the correlation between RAN and reading across languages.

Another study conducted with 2nd grade and 4th grade Mandarin speaking students from Taiwan with 4 different RAN tasks: RAN-Colors, RAN-Digits, RAN-Zhu-Yin-Fu-Hao, and RAN-Characters (Liao, Georgiou, & Parrila, 2008). 50 stimuli were presented on a computer screen in each task. Besides the RAN tasks, students also participated in nonverbal intelligence measure, sound deletion task, tone sensitivity test, word series test, figure memory test, non-character recognition task, radical awareness task, graded Chinese character recognition test, and one-minute reading. The correlation of RAN-reading is stronger for students in 4th grade than in second grade and its importance also increases with grade level. Liao et al. hypothesize that the nature of the Chinese orthography could be accounted for this finding as the correlation for

English readers is the opposite. Chinese students learn more and more characters and the accuracy and efficiency to identify the characters during reading process is crucial in reading fluency. RAN is a possible explanation for this automaticity of lexical access. Fluent Chinese readers with advanced reading skills begin to identify compound characters as single units. The finding of this study also concluded graphological stimuli (RAN-Zhu-Yin-Fu-Hao and RAN-Characters) are better predictors than other RAN tasks. Visual differentiation skills are essential to reading in Chinese due to the numbers of possible homophones for each spoken syllable (McBride-Chang et al. 2003; Liao et al, 2008). Results of RAN-Character as a significant predictor for reading accuracy and reading fluency are also found in other research (Ding et al., 2010; Liao et al., 2008; Xue, Shu, Li, Li, & Tian, 2013).

Ding et al. employed 5 different RAN tasks in their study (color, object, number, Pinyin, and characters) along with Color Span Test, Chinese word and passage reading and Chinese spelling on Mandarin-speaking students from China (N=243) ranging from Grade 1 to Grade 5. Subjects in this study were from relative low socioeconomic status area where a local dialect different from Mandarin is spoken. Younger students were less prepared in Mandarin than older students as they have less time in learning Mandarin. Their finding showed that poor readers were slower in RAN tasks but the trajectory was similar to that of good and regular readers. Ding et al. explained their findings in three major areas. First, the characters in the RAN task were overlearned through rote memory. Since Chinese characters have relatively arbitrary associations between print and sound. The characters, once learned and practiced can become a symbolic stimulus as in other RAN tasks. Second, the simple characters are often the base of compound characters even though the pronunciations of compound characters are not necessarily regular. Faster speed in recognizing single characters could contribute to recognizing more

complex compound characters consisted of known simple characters. Third, Chinese unique logographic orthography emphasizes more on visual components. Students need to toggle between phonological information, auditory-visual transfer, and morphological print information in the reading and writing tasks. RAN-Character task has the visual element uniquely present in Chinese thus explains the visual skill as an important factor in RAN-Character.

In a larger scaled study by Xue et al. (2013) designed to examine the significance of five cognitive factors in the development of reading in Chinese. These five factors included verbal memory, phonological awareness, orthographic awareness, morphological awareness, and RAN. More than 400 students each in Grade 2, 4 and 6 from diverse socioeconomic status in 8 districts in rural and urban areas near Beijing were involved in this study. There were two literacy tests and 10 various tasks related to cognitive skills. The character reading used in the literacy test included 150 characters in School Chinese including characters of different complexity and frequency. RAN-Digit was one of the cognitive tasks. The study concluded that phonological awareness, morphological awareness, RAN speed, and orthographic skill contributed to the Chinese characters naming and reading fluency. Especially, RAN speed contributed significantly to character naming and character naming was essential to reading fluency.

All in all, many studies conclude that RAN is a reliable and significant predictor for reading, not only for alphabetic languages but also for non-alphabetic languages, such as Chinese (Georgiou et al., 2006; Georgiou et al., 2008; Kirby et al., 2010; Lervg & Hulme, 2009; Liao et al., 2008; McBride & Wang, 2015; Xue et al., 2013). RAN remains effective in predicting the reading development in small- and large-scaled research, with subjects from various age groups, and in studies conducted with different lengths of time.

2.4.3 Morphological Awareness.

Learning to read and write is to make connection of the oral language to its orthography. In other words, to map the spoken language to print. The smallest meaningful unit in a language is a morpheme. Morphological awareness is the ability to manipulate and to combine morphemes to form new acceptable meanings in the language. The smallest written unit in Chinese is a character. A Chinese character at the same time is a syllable with independent meaning. A Chinese character is also a morpheme. Chinese words are formed by combining one or more characters/morphemes. A character appears in different words may have similar or c different meaning. For example, the character 生 shēng have different meanings in 生日 shēngrì ,(birth, birthday) and 生菜 shengcài (raw, lettuce). It is an essential literacy skill to understand the multiple roles and meanings a same character might represent when used in different words.

Given the fact that Chinese has more homophones than other languages, the morphological awareness is important not only limited to oral language but also in reading. There are about 7,000 morphemes in Chinese and only about 1,200 syllables. On average, about 5 morphemes share a syllable (Shu, 2003). Chinese children have to face the challenges in the numbers of homophones and all the possible different meanings. To distinguish one possible meaning from another is solely dependent on the context when speaking. In writing, the different characters used can avoid the ambiguity present in the oral language due to inadequate contextual information. Children with more developed morphological awareness are able to determine whether the homophones in different words are the same or different more easily than those who have less developed awareness (Ho et al., 2011; Lei et al., 2011; Yeung et al., 2011).

Shu, McBride-Chang, Wu, and Liu (2006) also summarized that morphological skill to distinguish different homophones is unique and essential in the early development of reading

Chinese characters (Shu et al. 2006). In the study conducted by Shu et al. (2006), more than 750 students in Grade 5 and Grade 6 in Beijing were screened and the final selection for their study consisted of 75 children who demonstrated clear reading difficulties and 77 children with normal reading ability of their grade level. The students participated in many tasks representing 9 cognitive constructs that could be important in Chinese reading development. The morphological awareness tasks included in this study were morpheme production and morpheme judgement. In the morpheme production task, the students were asked to produce two words consisted of the target morpheme presented orally. The target morpheme in one of the samples must have the same meaning but the other, different. The morpheme judgement task required the students to identify whether the target morpheme in the 2 two-morpheme words had the same or different meaning. The results indicated morphological awareness as the strongest and most consistent predictor of literacy skills across both groups.

A longitudinal study by Wu et al. (2009) investigated the relationship between morphological awareness and Chinese children's literacy development by involving 6 classes of first-grade students from a public elementary school in Beijing. Students were divided into two groups with one group receiving enhanced instruction on the morphology of characters and words during Grade 1and Grade 2. At the start of the study, pretests were given to the first graders to measure different literacy skills. The tasks for phonological awareness were discriminating tones and rimes; for morphological awareness, judgements in radical form and meaning, and discriminating morphemes; for the early reading and writing skills, writing syllables and complete sentences in Pinyin. The reading tasks for Grade 2 were sentence reading comprehension and vocabulary; for writing tasks, dictation of characters and multi-character words, 2-second delay copy of 60 characters, and write as many characters from memory in 5

minute; for morphological awareness tasks, interpret novel words, discriminate morphemes, radical meaning judgment, make as many words with 15 target morphemes, and write as many characters consisted of 15 target radicals. The reading tasks for Grade 3 were paragraph reading comprehension with cloze test, vocabulary, mark true or false after reading sentences, and find wrong characters (correction was optional); for writing tasks, dictation, copy characters and 2-second delay copying; for morphological tasks, same as Grade 2.

The enhanced curriculum as intervention by Wu et al. (2009) included graphomorphological analysis of characters and morphological analysis of words. The goal was to equip students the skills for applying such knowledge for unfamiliar characters and words in future reading. The teaching methods included direct instruction and guided discovery and the instructional steps were explicit. Teachers in the enhanced curriculum group received special trainings before school started and were required to attend weekly seminar. A very important part of the curriculum was to extend the learning by encouraging students to use newly learned characters to make up new words. It solidified the understanding that a character often took on different meanings when used in different words.

The results of the study by Wu et al. (2009) showed that instruction including explicit morphological components had positive and significant outcome on the literacy development for both Grade 1 and Grade 2. The instruction expanded not only the morphological awareness and knowledge of the students but also accelerated their reading and writing skills. Wu et al. (2009) reported "An additional corroborating findings is that in each year of this longitudinal study morphological awareness at the beginning of the school year predicts growth in literacy during that year (p.47)."

In another study by Yeung et al. (2011), the morphological awareness task was given orally and did not include visual presentation/identification of characters. Three two-character words shared a homophone and the homophone was in the same position in all these words. Two out of the three homophones were the same character and one was different. The children who were able to identify more correct sets understood the two words sharing the same character had semantic connections.

Unlike RAN, the morphological awareness does not have any standardized measurements to be used. The implication from the study by Wu et al. (2009) shows strategies to incorporate more morphological information when new characters are introduced. The two sample lessons included in Wu et al.'s research highlight semantic radical, phonetic radical, radical meaning, phonetic analogy, and vocabulary expansion. Focusing the components of the structures in newly introduced characters and expand knowledge in vocabulary ensure the connection of the oral language and print becomes deeper. It can be internalized as long lasting skill that predicts and accelerates literacy development.

2.4.4 Orthographic skills.

Even though Chinese characters are visually complex, there are some internal components beyond the basic strokes that can be analyzed to assist learners in the reading process. Within the character structures, there are major components and subcomponents. The characters that consist of only one component and cannot be further broken down are called simple characters. Compound characters are composed of different numbers of subcomponents including some simple characters that become radicals when they are combined with other components. The numbers of subcomponents can range from two to five in compound characters. Semantic radicals and phonetics are the most common and important components

that make up about 70-80% of the characters (Shu et al, 2003). The semantic radicals and phonetics usually occupy specific positions within the character structures. The knowledge of the subcomponents and the structures of characters are crucial in the learning to read characters (Shu, 2003). Contrary to traditional believes that Chinese children perceive and memorize characters as a whole unit, many recent research results show that children begin noticing the components in early literacy development. They begin using orthographic knowledge to decompose characters into smaller units and reassemble them when they learn to write (Anderson, Ku, Li, Chen, Wu, & Shu, 2013; Shu, 2003; Tan et al., 2005). Shu (2003) cited research (Cheng & Huang, 1995; Li, Fu & Lin, 2000; Peng & Li, 1995; Shu & Anderson, 1999) in which Chinese students developed knowledge of radical positions at an early stage and their knowledge continue to develop gradually based on their reading experiences.

Su & Samuels (2010) investigated the developmental changes in character-complexity in their study of students from Taiwan. Students from Grade 2 (N=25, mean age 8.1 years), Grade 4 (N=24, mean age 10.0 years), Grade 6 (N=24, mean age 12.0 years), and college (N=25, mean age 19.6 years) were included in the study. All the students had average decoding skills for their respective grade levels. They were tests in three different experiments that required them to read equal numbers of real characters and pseudocharacters. Each experiment consisted of same numbers of characters with low-, moderate-, and high-complexity characters with mean numbers of strokes 5.53, 13.40, and 21.33. There were practice sessions for students from all groups to ensure that they were able to pronounce all the characters before the experiments. The three experiments were conducted in only one session in the same order for all groups. Rest time was allowed if requested by participants after each experiment. All participants finished the experiments within 20 minutes. The time for reading high complexity characters by younger and

less experienced readers were much longer because they spent more time paying attention to the subcomponents. In comparison, the older and more fluent readers processed the high complexity characters in less time as they were processing the characters as whole unit with their higher ability and experiences in reading. The findings indicate the younger reader process characters in an analytical way and the decoding process changes gradually over time from more analytic to more holistic with improved reading proficiency.

In terms of the hierarchy of how Chinese children perceive the subcomponents within characters, Anderson et al. (2013) examined the role of visual-orthographic processing in their experiments conducted with Chinese students in Beijing. In their study, visual-orthographic is defined as the properties of the written language that are independent of phonological, morphological, and semantic information. There were two experiments included in the study (tasks details summarized in Appendix D). In experiment 1, first graders from higher reading proficiency group began to perceive major components within the characters (i.e. chunking) but most of the students still perceived the characters as wholes. The results from this task reveals that in late second semester, first grade students already had the skill to encode characters into familiar chunks and the chunking skills are highly related to the reading proficiency. In experiment 2, comparisons of the results between students from different grade levels provided evidence that the ability to perceive characters with major components (chunking) continue to develop in the first few years of reading development. The relationship of familiar characters (both simple and compound characters) and reading fluency was stronger in Grade 1 than in Grade 4. Children perceived and detected the major components, especially familiar ones, much easier than other subcomponents. Evidence also showed students regarded the subcomponents as perceptual chunks. The arbitrary stoke patterns were the hardest in task for all the students.

The final results from this study conclude that skilled readers possess multi-level visual perceptions in recognizing different components within character structures. The levels are: 1) whole character –simple characters as components; 2) major components-radicals with independent meanings that do not stand alone; 3) subcomponents-without particular meaning or known pronunciation; and 4) separate strokes. Children's visual-orthographic skill, the ability in detecting the recurrent patterns in different characters, is a strong predictor in the early years of literacy development.

2.5 Instruction for Emergent Literacy Skills

Research on literacy development in different languages continue to explore and define cognitive skills involved in the reading development. What implications do we draw from what research have entailed in terms of designing age-appropriate and effective instructions and activities? Most kindergarten students enter one-way immersion program with little or no experience in the target language. Some emergent literacy activities for introducing concepts about the target language for younger children can be appropriate and less demanding at the beginning when general concepts of the target language are developing.

Early literacy, as defined by Roskos, Christie, & Richgels (2003), is "what young children need to know and be able to do if they are to enjoy the fruits of literacy, including valuable dispositions that strengthen their literacy interactions (p.52)." They recommend eight strategies for instructing preschool-age children that are research-base to promote early literacy skills and can also lead to later reading achievement in primary grades. The eight strategies are: 1) rich teacher talk; 2) storybook reading; 3) phonological awareness activities; 4) alphabet activities; 5) support for emergent reading; 6) support for emergent writing; 7) shared book experience; 8) integrated content focused activities. According to their recommendation, play is

an integral and effective way to make literacy activities enjoyable and meaningful for young children. Three out of the eight strategies, number 5, 6, and 8 are most strongly linked to play. Through enjoyable play, teachers can cultivate the children's curiosity and desire in seeking and exploring books and print. Oral language should be encouraged during play as it is the foundation for the development in reading and writing. Furthermore, reading and writing rely on each other in the developing process (Roskos, Christie, & Richgels, 2003). Providing cognitively appropriate materials to support emergent reading and writing through playful activities can yield positive and better literacy development results.

2.6 Effective Materials for Language Learners

In a book referenced by many practicing language teachers, Curtain & Dahlberg (2016) describe that children in kindergarten and primary grades are still at per-operation stage in many areas. Most of the children require large-muscle activities before they become skilled in small-muscle tasks. Teacher must have the physical characteristics of young children in mind when designing structured routines. Directions for activities must be very specific and repetitious. Varieties of activities can keep students engaged without tiring their short attention span.

Curtain & Dahlberg (2016) found the instruction in a K-8 language classroom should engage students in different levels of thinking. The levels are remembering, understanding, applying, analyzing, evaluating, and creating. Performance tasks should be designed and practiced from more basic levels to higher levels. Curtain and Dahlberg (2016) suggest teachers need to provide adequate assistance and support that language learners need in develop concepts and in completing tasks. The assistance and support, termed as mediation, must be offered to learners in various forms and in abundance within the learning environment. They include the use of booklets as an effective way for initial, developmental, or culmination introduction of

concepts, especially when the booklets are created with pictures and words. Booklets can be created in various themes and even shapes to suit any learning objectives (Curtain & Dahlberg, 2016). Well-organized and carefully-designed booklets can assist students in cementing concepts and are tangible learning evidences for students to share with each other and with their parents. They can include mediations needed for success in the classroom.

2.7 Core Components and Effective Model for Chinese Reading Instruction

In a 4-year longitudinal project, findings reported the literacy and cognitive-linguist skills of the participating students were effectively enhances through the proposed model. This project by Ho, et al. (2011) conducted in Hong Kong added Tiered 1 Intervention Model to traditional instruction to student in Grade 1 (N=223). Learning results were compared to students from a control school only instructed in traditional approach. The Tier 1 curriculum adopted a psycholinguistic perspective and skilled-based approach to promote literacy learning. Based on the findings from this project, Ho et al. propose oral language, morphological awareness, orthographic skills and syntactic skills as the core components in reading instruction. The Tier 1 Intervention instruction for oral language skills included in the model are expanding oral vocabulary and oral expression. The instructions in morphological awareness focus on distinguishing homophones first and later expand to include characters with multiple meanings. The instructions in orthographic skills bring students attention to character structures and different components within characters. Syntactic skills cover word categories, short phrases, word order, and common connectives. The Tier 1 Intervention design was based on the learning progression of the students and began from oral language and proceed to word acquisition, then sentence and passage comprehension.

Grade 1 Tier 1 Intervention instruction began with focus on oral language and word-level skill training. Starting in second semester of Grade 1, text-level skill training was added. At the beginning of the study, students from control school had better performances in reading-related cognitive skills. After 1 to 2 years of Tier 1 Intervention, students showed significantly better improvement in all areas (Ho et al., 2011). The instruction model tested in this project held positive effect at the end of grade 2.

2.8 Chapter Conclusion

The purpose of this study and project for developing and designing literacy activities for kindergarteners in immersion classroom setting in the U. S. This project is designed to meet the following goals:

1. Summarize the history of immersion education in the United States and the national initiatives that helped accelerated the recent growth in immersion programs with some challenging issues immersion programs are facing,
2. Provide fundamental background information in Chinese literacy development, including factors that predict success in naming Chinese characters and reading fluency,
3. Provide literacy activity designs that are based on these research findings,
4. Provide activity templates to facilitate early literacy development in immersion kindergarten classroom.

This chapter provides information about spoken and written Chinese as main focus. Reading developmental stages/phases in learning to read alphabetic languages and Chinese are summarized. The designs of this project aim to meet the developmental needs in each stage. Research of cognitive skills for predicting Chinese literacy are discussed. Some instruction

strategies and effective materials and model for young learners conclude the chapter. The chapter lays the foundation for my project design of age-appropriate early literacy activities for use in immersion kindergarten classrooms in the United States. The next chapter details the process of creating the age-appropriate early literacy learning activities.

Chapter 3 Process

3.1 Chapter Overview

This study and project is to develop age-appropriate literacy activities for Chinese immersion kindergarten classes. The goals for this study and project include the following components:

1. Summarize the history of immersion education in the United States and the national initiatives that helped accelerated the recent growth in immersion programs with some challenging issues immersion programs are facing,
2. Provide fundamental background information in Chinese literacy development, including factors that predict success in naming Chinese characters and reading fluency,
3. Provide literacy activity designs that are based on these research findings,
4. Provide activity templates to facilitate early literacy development in immersion kindergarten classroom.

The activities designed in this chapter are based on literature reviewed in the previous chapter. The research findings are assimilated and incorporate into the designs of this project. The project can be divided into two main categories. The first category is the learning materials and activities for learning to read and write characters. The second category is applying learned characters in reading practices at sentence and short text level.

This chapter begins with the challenges specific in our immersion program followed by our adaptation to address and to overcome the challenges. The two main categories of activities will be described in details with samples. The designs of these activities can be used as templates to create differentiated materials to meet the needs of individual students.

3.2 Challenge in Meeting Required Time for Selected Language Arts Curriculum

During 2016, I visited 13 different Chinese immersion programs in Portland, Seattle, and San Francisco Bay area. During these visits, I spoke with administrators and teachers about their program philosophy, curricula, materials, and also assessment tools. The information collected and the model observed were valuable in helping create our own program and make decisions in the implementation and curricula selection. With positive feedback from teachers who have used the language arts materials called *Better Immersion* combined with our own material reviews, our district proceeded to purchase the kindergarten class set by *Better Immersion*. No further commitment to use this particular curriculum was made at the time of the purchase. We would evaluate the progress and the learning results before making future decisions.

The series by *Better Immersion* is specifically designed as Chinese language arts materials for immersion programs in the United States. The class set includes teacher manuals (four volumes of 8-week lesson plans), beginner readers (in sets of six, two different sets for differentiation), teacher big book (compiled student readers bound into a big volume), classroom posters, vocabulary picture cards, character cards, and sentence pattern strips. The kindergarten curriculum is theme-based and many of the lessons align with our kindergarten social studies academic plans, especially the themes about self and immediate environment. The required instruction time is 90 minutes per day, 5 days a week. Each of the teacher manuals includes 8 weeks of lessons only. It allows teacher some flexibility to adjust the pacing due to instruction time loss, due to events such as holidays, early release days, parent-teacher conferences, and field trips etc.

The kindergarten Chinese teacher and I met weekly during the first quarter to evaluate learning content and goals. Despite the purchased materials, modifications, and adjustments were necessary to meet our program's objectives and district standards.

The 50/50 model adapted by our district includes two immersion classes in each grade of all our immersion programs. One of the immersion classes starts the school day in the immersion room and the other in the English room. The classes switch rooms every day in the middle of the day after lunch and recess. Both kindergarten classes remain on the same schedule for a full quarter. At the beginning of a new quarter, the class that starts in the immersion room will begin the day in the English room, and vice versa. Theoretically, the total instructional time for each classroom is roughly the same. The weekly Chinese instruction time for our first-year kindergarten Chinese classes amounted to about 10 hours for the morning and 9.5 hours for the afternoon. The non-Chinese instruction time for our immersion students includes physical education, music, art, health, and library. The time needed for morning check in, preparation for lunch and recess, and getting ready at the end of the day further reduce the limited instruction time. It is impossible to meet the 90-minute daily instruction required for *Better Immersion* curriculum while social studies and science content are also part of the required curricula.

3.3 Specific Adjustments Made in our Program

After careful consideration, the Chinese teacher decided to reduce the 82 characters introduced in kindergarten to 60 characters for our first-year instruction. The rationale behind the reduction is to establish an attainable goal with a solid foundation in the beginning. It is better than an ambitious goal that could lead to frustration for the teacher and the students. The instruction in first quarter mainly focused on students' perceptive language skills, such as following basic directions and becoming familiar with the daily routines. The Chinese number

characters from 1 to 10 were introduced in the first quarter with no expectation in writing. Twenty characters were scheduled be taught in each quarter (from second quarter through the fourth quarter). The number characters were included in the twenty characters for second quarter.

3.4 Age-appropriate Early Literacy Learning Activities

My literacy activities for our Chinese immersion kindergarten classes are divided into two major areas, characters learning and applying learned characters in reading sentences and short texts. Each category is consisted of many different types of activities for teacher's instructional use as well as for students as independent practices. These activities can be used as a regular part of the curriculum or as supplemental activities. Within the character learning, activities are further divided into character recognition and handwriting. The character application activities include character naming fluency, reading at sentence and at text level.

3.4.1 Characters learning activities.

After our curriculum goal of 60 essential characters for kindergarten was set, the Chinese teacher and I began to examine the materials and make necessary modifications. The 20 essential characters selected for each quarter were introduced in 7 weeks, roughly 3 characters per week. There was review period at the end of each quarter (one or two weeks) after all 20 characters were introduced. This allowed time for the students to apply learned characters in reading sentences and short texts. It also provided time for the students who needed additional time in learning the characters. The following criteria were considered in designing materials and activities for learning characters:

1. Our students had no prior experiences with Chinese script,

2. The study by Chen (2004) concluded Chinese children stay in the visual stage longer than children learning English,
3. Visual skills are essential in the literacy development (Ding et al., 2010; McBride-Chang et al. 2003; McBride & Wang, 2015; Shu et al.,2003; Wu et al., 2009).

Our materials utilize large fonts to cultivate the visual skills as the main developmental characteristics of beginner readers. To create a print-rich environment, abundant materials are displayed in the classroom and many more are organized in the table supply boxes for students to use at any time. The immersion teacher and I met weekly to address the challenges and needs in the classroom. Our meeting notes and the consideration of the beginner readers' developmental characteristics in different stages were taken into account for my design. The teacher and I then reviewed the materials designed and made changes if needed before the materials were made to be used in the classroom.

3.4.1.1 Character flash cards and activities.

The first step was creating flash cards for introducing characters. All the flash cards are much larger in size than the materials we have purchased. Larger sizes provide students clear view of the details within characters since they have no prior experiences with Chinese orthography. Table 5 provides the approximate sizes of the character cards and suggested use. A full page is letter size (8.5"x11").

The full-page flash cards are designed to be used by the teacher and an additional set was posted on one of the walls in the classroom to create a print-rich environment for the students. Each desk group has a table set in the supply caddy. The teacher can easily find materials to use when working in front of the classroom and with small groups. Students are welcome to use the cards at any time when they need reference or when they finish their work. Immediately after

the cards were available at the table groups, students began using them. They were very creative to make up their own games and formed fluid small groups when they played their invented games.

Table 5

Character Flash Cards and Suggested Uses

Set	Layout	Suggested Use
Teacher 8”x11”	1 character per page	• Initial introduction of the character • Classroom word wall • Small group instruction
Table set 1 4”x5”	4 different characters per page, copied on different colors of card stock paper	• Keep a different color set at each table group • Play set for small groups
Table set 2 4”x5”	4 same characters per page, copied on same color card stock paper for all students	• For all students when a character is introduced • Students keep their set at school for review, practice and games
Student set 2”x2 ¼”	20 same characters per page, copied on same color card stock paper for all students	• Awarded to students to take home when they have learned the character • Home review

3.4.1.2 Character introduction worksheets and activities.

The materials for handwriting practice focus on accommodating kindergarteners’ emerging fine motor skills. Many alternative activities besides repeated copying are available for the students to learn through hands on experiences with different materials. Since visual factor (Chen, 2004; Ding et al., 2010; McBride-Chang et al. 2003; McBride & Wang, 2015; Shu et al.,2003; Wu et al., 2009) and fine motor skills are main considerations, the introduction of a

new character begins with a full-page large outlined example of the character. Arabic numerals are incorporated into the outline to show the stroke order. The use of larger visuals hopes to strengthen orthographic awareness. The top priority to develop oral skills in first quarter continues to be a major focus through kindergarten year. Limited time is available for explicit teaching in writing characters. With novice-low language proficiency at this early learning stage, the focus is on the overall introduction of concepts in the orthography more than the proficiency in writing characters from memory. Students are encouraged to color the characters or use different patterns to decorate the characters. These are more age-appropriate and preferred activities for learner of this age. The students have prolonged visual experience and interaction with the characters during coloring and creative play. The activities provide hands-on experiences of active learning for students to discover stroke types and the sequence of strokes for later writing experience. By including Arabic numerals, the concept of stroke order is introduced from the beginning and the information can be easily retrieved by the students without teacher's assistance.

Even though Chinese students perceive components bigger than basic strokes when they read and write characters in the early reading development (Anderson et al.,2013), but this does not apply to the kindergarten students in our immersion program when they have only begun the learning. Teaching them how to produce the stroke shapes correctly becomes the priority. Introducing simple and less complex characters with focus on the types of stroked as basic building blocks is a logical start and age-appropriate. Most of the characters introduced during this time are simple characters (whole character) that are most prominent components according to Anderson et al. (2013). We hope to use prolonged visual contact when the students engage in coloring or use small objects in making these characters to boost the learning results. The

process can help the students internalize the strokes shapes. Students work from the smallest building blocks up at this stage toward the components for later reading and writing of simple characters and compound characters. The outlined characters with embedded Arabic numerals is the guided decomposing process and at the same time for instilling the concept of stroke shapes and sequencing. Following the traditional step-by-step direction when tracing and writing is the guided reconstructing process in writing characters correctly (Anderson et al., 2013; Shu, 2003; Tan et al., 2005). The tracing practice helps the students understand the spatial relationships between different strokes and the whole structures of the characters. The gridded writing spaces strengthen the concept that all characters occupy equal space when completed. According to Curtain and Dahlberg (2016), these routine steps are mediations which are important to scaffold the learning for later success and cultivate students independent learning.

The character introduction begins with the Chinese number characters that have been introduced in the 1st quarter. Because the students have not practiced any writing to date, arrows are included in the outlined characters next to the numerals to assist the understanding of the stroke order and stroke direction. The traditional stroke order with step-by-step progression is displayed at the lower part of the page. There are 5 characters for tracing and two additional spaces for independent practice. Appendix E is an example of the handwriting introduction worksheet. The step-by-step traditional stroke directions are computer generated. Examples generated from both websites are included in Table 6 for comparison purpose.

After careful consideration, the final decision was to utilize the free service by *YES! CHINESE* (http://www.yes-chinese.com/tzg/). The step-by-step traditional stroke direction by *YES! CHINESE* has numerals included, which aligns with the embedded numerals nicely. The kindergarten teacher and I agreed that the progression of the strokes and the relationships of each

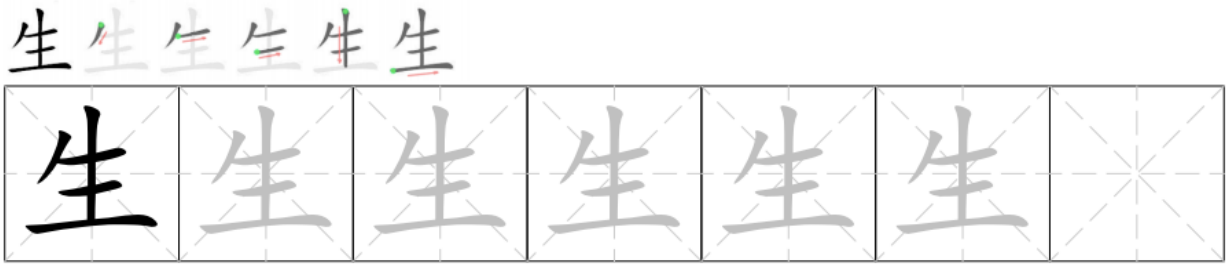
stroke are also easier to understand. The space for writing does not include so many dotted lines and might be less confusing for the students. Even though the example from *Hanlexon Chinese* has small dots indicating beginning points of the strokes with arrows showing the direction how each stroke is formed, yet the details are very small and can be easily overlooked. Table 6 shows the step-by step stroke direction progression in two different styles from the two different websites.

Table 6

Comparison of Two Different Writing Designs

Sample 1 from YES! CHINESE

Sample 2 from Hanlexon Chinese



After a new character is explicitly taught and routines for practices with character flash cards already established, the character introduction pages are distributed to the students for independent exploration. Students are encouraged to color each stoke accordingly for learning the correct sequence. They can also use different designs and patterns to fill in the space of each

stroke. This helps them to explore the features of each stroke and begin to understand the use of the numerals included in the outlined character. After the creative exploration, they will trace the character using the traditional step-by-step stroke direction before attempting to write on their own. The students have an opportunity for coloring (large-muscle skill) before preceding to writing (small-muscle skill). This learning progress suggested by Curtain & Dahlberg (2016) can promote success and avoid frustration. It is crucial that the students follow these steps under careful supervision at the beginning to establish good working habit. A few binders with these character introduction worksheets (in protecting sheets) are available for students and the students should have easy access to them. Students are encouraged to take the pages out of the binders for individual practice during free choice time. More suggested materials for these worksheets and creative use are listed in Appendix F.

3.4.1.3 Handwriting booklet.

After the initial introduction of characters, students need more practice but not to a degree that it becomes a burden in their daily routine. A handwriting booklet is designed to assist the students in practicing and reviewing characters learned. Booklets are effective materials easily handle by teachers and students in the initial, developing and culminating stages of learning (Curtain & Dahlberg, 2016). There are three booklets designed for Quarter 2 through Quarter 4. Each booklet includes 20 characters that are introduced and practice during that quarter. Inside the cover is a summary page of 20 basic strokes types found on a website called Happy Cottage that promotes Chinese learning (http://happycottagesg.blogspot.com/search?q=stroke+order see Appendix G). There are different ways of categorizing stroke types. Shu et al. (2003) state 8 basic strokes but *Better Immersion* includes 32 in the teacher's resource guide. The page from the Happy Cottage website is chosen because it is not too overwhelming but

includes enough commonly used strokes. Each stroke is accompanied with an arrow to show the direction how the stroke is written. Students were instructed to finger-trace all of the strokes before they begin practicing handwriting in the booklet. The page following the stroke types is the direction of how to use the booklet. It combines Chinese text and small pictures that are easy for students to understand and follow (see Appendix H).

The actual writing practice pages are visually similar to the character introduction worksheet so the students do not need extra coaching in how to use the booklets. Each character has two separate pages designated for practice. The first page is on the left side of the booklet when it is open. This page has the big outlined character with Arabic numerals, traditional step-by-step stroke direction, and two additional lines for practicing. The big space around the outlined character can also be used for students to draw pictures that will help them remember the meaning and pronunciation of the character. Each practicing line has 5 characters for tracing and two extra spaces for independent writing. The second page is on the right side of the booklet when it is open. This page also has the traditional step-by-step stroke direction on the very top and then 7 lines of 7 spaces each. The first two lines are identical as the two lines appear on the first page with 5 characters for tracing and two spaces for independent writing (see Appendix I). After 20 characters, there are additional pages for students to add new characters they would like to learn. These pages include a big area for writing a large character and some practice spaces below. There are also additional pages for students to practice any characters they want to. These practicing pages only have the lined spaces for writing.

The back cover of the booklet has a page of quarterly summary with the 20 characters included in the booklet. Students will color each character when they have learned to write it

from memory (See Appendix J). A separate page of this record is sent home to be displayed at a prominent location for the students to celebrate their learning result and for constant review.

The handwriting booklet is designed with the 20 characters learned in a quarter. Ample room and practice spaces are available but the practice is not to be completed in one or two practice sessions. Students should not be writing more than a few of the same characters each time. The booklet is designed to train students to write each character in a very conscious manner. Students are not writing many repetitions of each character but a few of many characters when they practice. The writing practice should be a process of active learning instead of mindless repetition. Practicing writing different characters over time will ensure mastery of these characters. Since all characters learned in each quarter are on different pages, it is easy for the students to review the learned characters without the teacher to spend time in creating materials for review use.

Constant review of characters learned in school is important. The immersion parents can only reinforce learning in limited manner. The tear apart workbook pages with one character for practice do not provide review for characters learned when students practice in school or at home. By compiling the 20 characters learned in a quarter into a booklet. Students can review constantly and independently when they are familiar with the procedure. Writing a few of each character is not a gruesome task even for kids this age. The review writing can be an independent small group activity that requires that teacher little to no preparation when the routine is established. Students can be actively learning and reviewing the characters to strengthen their reading and writing skill in a meaningful and quiet activity. With the writing booklet, all students can be working at the own pace and the teacher does not have to worry

about differentiating materials for this independent activity. It allows the teacher to prepare other learning activities and to work with other students.

ASD has its own printing service that helped in revising the writing booklet format. The printing service produced professionally printed and bound volumes of these handwriting booklets with the logo for our own Chinese Immersion Programs. The booklets are easy to store in a bin. Students have easy access when they choose to work on handwriting.

3.4.2 Reading Activities.

Reading activities designed include several levels of practices. There are activities for character reading practice, sentences reading, and short texts reading. The designs follow the core components suggested by Ho et al. (2011). Each design will be described with material samples.

3.4.2.1 Character naming fluency probes.

As summarized in the literacy review, Rapid Automatized Naming (RAN) is a strong predictor for reading success for both English and Chinese beginner readers. Especially RAN-Character is a robust and reliable predictor in Chinese character naming. The character fluency reading probes are based on the principle of rapid naming and only include 3 characters in each probe at the beginning. More characters can be included in a probe for differentiation purpose.

RAN uses familiar stimuli to assess the process speed of beginner readers. To follow the principle and the design of RAN assessment, the characters included in each probe should be explicitly taught and practices in class. Students should have the opportunity to practice writing them in more than one practice sittings. Ideally, students should at least become very familiar with the characters if they have not yet mastered the characters in each reading probe. These reading probes include controlled characters and are only limited to 25-30 characters per page

instead of 50 items in the RAN tests. All the characters are displayed on one page in large font size. The characters are listed once on the top of the page and underlined. Then the 25-30 characters are displayed in rows of five characters each. A quick review of these characters to ensure that students know these characters is essential before reading the probe. Students should not be practicing any probe with any characters they have not mastered yet. This activity should be practiced with the whole class first until students know the practice routine by heart. Later, sets of the probes can be available for student use. These probes are short and should not take too much time. Students can work on practicing reading the probes by themselves or with a partner. Probes can be stored in an area easy for the students to access. It is a good anchor activity for students. Timers can be introduced later to make the activity more challenging. Students can keep a personal record in reading these probes.

3.4.2.2 Sentences and short texts reading activities.

With increased number of characters learned and more oral language, students will be able to apply what they have learned to read short sentences. According to the Tier 1 Intervention Model, Ho et al. (2011), the word-level skills proceed the text-level skills. The sentences can begin with familiar patterns that are practice orally, such as dates, and other sentences used during calendar routine. Gradually, the sentences can be combined into short texts to increase the endurance in reading practice. Songs and rhymes that students have learned are good ways to reinforce the print concept that each syllable in Chinese is represented by a character (Shu et al., 2013).

Songs and rhymes can be divided into smaller sections such as individual character cards and sentence strips. Teachers should explicitly introduce each short text and practice with the whole class before letting students use the activity kits. The students can work alone, with

another student, or in a small group. Many of the sentences reading practice are embedded in the short texts activities. Appendix L is a table of suggested activities for practicing reading short texts. Materials needed are included in the table.

3.5 Chapter Conclusion

This study and project is to develop age-appropriate literacy activities for Chinese immersion kindergarten classes. The goals are summarized as:

1. Summarize the history of immersion education in the United States and the national initiatives that helped accelerated the recent growth in immersion programs with some challenging issues immersion programs are facing,
2. Provide fundamental background information in Chinese literacy development, including factors that predict success in naming Chinese characters and reading fluency,
3. Provide literacy activity designs that are based on these research findings,
4. Provide activity templates to facilitate early literacy development in immersion kindergarten classroom.

Based on the literature reviewed in the previous chapter, this chapter includes many types of literacy activities ranging from character-level to short text-level as suggest by Ho et al. (2011). The activities cover two main categories. The first category is learning to read and write characters and the second category is applying learned characters at text-level. Examples of these materials, suggested use, and detailed activities are included as appendices in this project.

The activity ideas are universal and transferrable for teaching and practicing other content. The writing materials' layout can be regarded as templates for later adaption and modification to teach different characters. The general designs of various activities can

accommodate learning and practicing of texts learned in the future. The teacher and the students can even create more texts together for practice. The next chapter provides findings from empirical feedback from the use of these learning activities.

Chapter 4 Findings

4.1 Chapter Overview

This study and project is to develop age-appropriate literacy activities for Chinese immersion kindergarten classes. The previous chapters provided information to meet the following goals:

1. Summarize the history of immersion education in the United States and the national initiatives that helped accelerated the recent growth in immersion programs with some challenging issues immersion programs are facing,
2. Provide fundamental background information in Chinese literacy development, including factors that predict success in naming Chinese characters and reading fluency,
3. Provide literacy activity designs that are based on these research findings,
4. Provide activity templates to facilitate early literacy development in immersion kindergarten classroom.

The materials and activities completed for this project include; 1) character flash cards; 2) handwriting booklets; and 3) short texts activities. These materials and activities were created to accommodate the language art learning in the immersion kindergarten classes in the Anchorage School District. The Language Arts curriculum used in this immersion program is from a series called *Better Immersion.* The kindergarten curriculum includes 82 characters introduced throughout the year and the decodable texts consist of these characters are introduced in 2nd semester. Due to limited instructional time, only 60 out of the of the 82 characters were introduced. The literacy activities designed in this project use these 60 essential characters exclusively.

In the ASD, a school year is divided into four quarters. Each quarter in lasts 9 weeks, except the 4th quarter that has a few additional days in the 10th week. The kindergarten classes have a delayed start as the first week of school is for the classroom teachers to meet with the students for initial assessments. This decision of focusing solely on the oral language and delaying the reading and writing until the 2nd quarter followed the Tier 1 Intervention Model from Ho et al. (2006). The instruction for our first kindergarten classes stressed on assisting students in becoming familiar with the classroom routines and develop as much as possible in oral language. The number characters were shown in the 1st quarter to introduce the syllable-to-character concept without any emphasis in writing.

The 60 characters were officially introduced in the 2nd quarter with systematic and explicit instructions. 20 characters were taught and practiced in each quarter. Initial instruction of new characters began with the character flash cards to focus on visual skills. The writing introduction worksheets were used after students had used the character flash cards in learning games. The handwriting booklets compiled all 20 characters for each quarter but were not used in 2nd and 3rd quarter this year because the designs and printing were only completed later in the 3rd quarter. The first handwriting booklet was ready for use in 4th quarter. The completion of the short texts was in the beginning of the 4th quarter and only 10 out of the 35 short texts were used during 4th quarter. The teacher used the short texts as a whole class reading activity. The suggested learning activities accompanying the short texts were designed as optional differentiated activities that student could use independently as learning or mastery practices.

This chapter will provide findings from the trial use of these materials created for this project. The findings are from the use of the materials and activities created for my project during 2016-2017 school year. The results including the teacher's feedback, students' learning

responses, and some challenges. The findings are presented according to the types of materials, which are character flash cards, writing booklets, and the short texts activities. Random Automatized Naming (RAN) fluency reading probes were created but not used during this school year so the findings will not include these probes.

4.2 Findings

My position with the Anchorage School District (ASD) as a Chinese Immersion Teaching Specialist is to support the classroom teacher in curriculum design and instruction strategies in Chinese language arts, social studies, and science. The social studies and science curricula for the Chinese Immersion Program align with ASD's academic plans. The flexibility in these content areas is limited. However, the Chinese language art curriculum and the supplemental materials allow us more flexibility and creativity for developing the students' basic language fluency at the early stage of language acquisition. More design and additional preparation are needed to achieve language proficiency goals set by all immersion programs in the district. It demands much attention and creativities to introduce a language that is not commonly taught at elementary level.

Adequate scaffolding and spiral learning are the essential consideration and the very core of the designs for this project. The materials created are character flash cards, handwriting booklets, RAN fluency reading probes, and short texts. Except for the hand writing booklets, the rest of the materials include various sizes for teachers and students. RAN fluency reading probes were developed but not used at all at this time. Many alternative activities accompany the use of these materials are designed to keep the students engaged while practicing the content and limited characters. After the trial use of these materials, the findings including the teacher's feedback, the students' learning response, and the challenges will be discussed accordingly.

4.2.1 Character flash cards.

Several sizes of flash cards were designed and printed out for the teacher and the students. The teacher set for initial introduction use were the largest in size. Each card is 8 ½ "x11" (full-page) and consists of only one character. The Chinese immersion teacher preferred these character cards better than the ones that came with the curriculum set purchased. The teacher prepared one set to use with the whole group. The students usually gathered sat at the carpet area in the front of the classroom when she taught the lessons. An additional set was prepared for display on one of the walls in the classroom. The cards were gradually added to the wall as the characters were introduces. Students can easily see these large size characters from every corner of the room. The teacher could refer to the characters on the wall during instruction without having to go through the set in the front of the classroom for the ones she needed.

The smaller table sets (4 characters on a full- page), were printed on different colors for the table groups. The size of these table sets fits perfectly into the supply boxes. As soon as these cards were placed at the tables, the students began using them right away. They read the cards and separated them into different piles. The students held up the cards for others to read and they played matching games. They even helped each other learn the unfamiliar ones. They invented many games and used the cards when they finished their work. The learning response form the students was definitely positive and the creative ways they invented in using these cards was impressive. Their frequent use was the most rewarding results for the teacher and for me. After observing how students used these cards, the teacher decided the size was appropriate for the little kindergarten hands and the color-coded cards were easy for students to pick up and organize after use.

The smallest size (individual set) was not made for the students this year. The intention of using these cards as rewards was not established either. The teaching assistant had already prepared small character cards for a small group character learning activity. The activity let the students keep the learned characters in a small box with their names on it. Unfamiliar characters were set aside. Students worked hard to earn their characters to paste into a character book they made for taking home later. There was a wall chart near the table where the daily character learning activity took place for recording the progress.

4.2.2 Handwriting booklets.

The character introduction worksheets were made ready early in 2nd quarter for the teacher and the students to use. The students take the worksheets home after completing them at school. The extra ones in binders were accessible for the students as a sponge activity. The students enjoyed using dry erase markers to write on the protector sheets. The clean-up was not quite as satisfactory or expected. I suggested to create a classroom job to assign a student to take care cleaning the pages with damp paper tower. It instills sense of responsibility and also helped maintain the neatness of the materials for later use.

The idea of creating the booklet came at the end of the second quarter when the teacher and I began discussing possible activities for table groups. The need of an independent activities for rotation arose. An activity with consistent directions and without constant preparation that could provide additional writing practice was our ultimate goal. I began with the character introduction worksheets that students were already familiar. A full page of additional guided practice and independent practice spaces were added to each character. These pages were compiled into booklets. There were three booklets in all. Each one was consisted of the 20 characters introduced in each quarter. ASD's printing service assisted in the printing and

binding these booklets. Heavier paper was used for the cover of the booklets. Different colors were selected for the three booklets. Even though three booklets were designed, the first one being printed was Booklet 3 in the series. The copies of Booklet 3 were available early in the fourth quarter and immediately became a very good independent small group activity. Students were instructed to write 10 characters of their own choice. This assignment could be 10 different characters, 10 of the same character, or any combination they wished. They liked the choices and were on task during the work time. Small chatters in English were inevitable at this table. Occasionally, short exchanges in Chinese (reading the characters to self or others) could also be heard. The teacher checked the students' progress when able and reported the students were able to follow the directions without difficulty but sometimes they "sneaked" some steps. The teacher corrected the students by showing the stroke order when she noticed any incorrect writing. The students usually tried harder after they had received correction. The characters for tracing were good mediation for the students to practice first before independent writing.

Students did utilize the additional pages designed for learning new characters of their choices. Some students with more advanced writing skills began using the space to draw and wrote creative short sentences. Many students told the teacher that they really liked the writing table and the overall learning response and results was positive. They enjoyed the writing process and could use the booklet creatively. The step-by-step stroke directions were clear and easy for them to follow. The writing space for each character was developmentally appropriate. Only two students had trouble from time to time to complete more complex characters in the space provided.

From the teacher's observation and some students creative example, the teacher requested to revise the third booklet to accommodate the students' enthusiasm in writing. Instead of the

blank space for the students to write new characters they wish to learn. The pages will be titled "draw and write" for students creative writing. Students with more advanced skills can write sentences and students with developing skills and draw and label. The pages can easily accommodate developmental discrepancy.

4.2.3 Short texts.

At the beginning of the 3rd quarter (after winter break), the students had learned about 20 characters, the teacher and I discussed the possibility of introducing short sentences to the students as part of the language arts instruction. The *Better Immersion* curriculum included readers but we wanted to provide more materials for reading practice. The teacher began creating short phrases and sentences with characters already introduced as a center activity. The phrases and sentences were short with concrete information that students could draw pictures to show their understanding. The teacher prepared 6 sentence strips and practiced reading them with the whole class every day. Students spent two separate days to copy the short phrases/sentences as a center activities. They add illustrations after the copying task.

35 short texts were created at the beginning of the 4th quarter. These short texts consisted of more characters and were slightly longer than the short phrases/sentences the teacher has created. Since there was already a text-level activity in place, the teacher only added the short texts as reading practice and did not spend time to set up any suggested activities. The teacher simplified some of the texts and replaced some of the unfamiliar characters with characters already introduced. The short texts created from this project and the revised version could both be used as differentiated materials depending on the students' reading levels. The classes had finished reading 10 of the 35 short texts. The teacher expressed that the short texts from this project were more difficult for most of the students to read as the sentences were longer and they

also consisted of more unfamiliar characters. The teacher had confidence that students would be able to read well after more practice. These short texts could also be introduced earlier in the next school year.

The purpose of the short texts is for additional practice. The sentence incorporated are familiar sentence frames introduced orally. Many oral expressions students do not see in print are included to expand their experiences with texts. These short texts are review passages for students to practice familiar characters in different contexts. According to Chen (2004), beginner readers rely on self-selected visually dominant features to memorize characters. They often had difficulty recalling the same characters at a later time in different contexts. These short texts can provide opportunities for the students to read familiar characters in different short passages with controlled and limited unfamiliar characters.

4.2.4 Challenges.

The first of the many challenges we faced was available time for instruction. It was also the biggest challenge. Although the teacher felt confident in the modification of the curriculum and was able to complete the instruction and practicing of the 60 characters with the students, some of the summative assessments planned for end of the school year were incomplete due to many unexpected schoolwide events. The original plan to assess reading of the 60 characters was not completed. Only 17 out of the 40 students (42.5%) were formally assessed by the teacher. Luckily, there was a learning record from their daily practice with the teaching assistant providing the final learning report.

The second challenge was the timing in making the materials designed in this project. The materials were designed over the course of the school year. Some of them were developed early and the teachers was able to use them for instruction accordingly. Due to limited time for

collaborating with the teacher, the materials were developed slowly and gradually. The short texts created at a later time were only partially used. The teacher had simplified some of the short texts. These slightly different versions of the short texts will be ready differentiated groups in the next school year. The learning routines and activities can be introduced and established early. Adaptation and modification of these short texts will continue to address needs in meeting the reading developments of our students.

The third challenge was the available time for collaboration was extremely limited. The teacher and I were both busy and hardly had time to meet for in-depth work sessions on the curriculum. Our weekly meetings were outside of our work hours. The rationales of the designs were sometimes not fully conveyed. Better and more frequent communication between the teacher and I could have helped speeding up the design and trial process. Questions about why and how these materials should be used could have been answered earlier for possible better results or for revising current designs.

The last challenge was the lack of participation for home practice and review. The teacher sent daily emails to inform parents the learning in the classroom. The teacher also prepared packets of optional weekly homework for reinforcing learning at home. The homework did not require a lot of time to complete. The result of returned work was much lower than expected. Out of the 40 students, only about 6 to 8 students returned the homework packets on regular basis (15%-20%). This was our first year of program implementation. We did not have adequate preparation and experiences in working with the parents to support the learning. We also have not practiced with the students in using the activities independently due to lack of experiences and time. The activities were only used in school this year. We hope to achieve

better management next year and aim to be able to send activities with students to connect school learning to home reinforcement.

4.3 Chapter Conclusion

The purpose for this study and project is to develop age-appropriate literacy activities for Chinese immersion kindergarten classes. Previous chapters have provided information in meeting the following objectives:

1. Summarize the history of immersion education in the United States or North America? and the national initiatives that helped accelerated the recent growth in immersion programs with some challenging issues immersion programs are facing,
2. Provide fundamental background information in Chinese literacy development, including factors that predict success in naming Chinese characters and reading fluency,
3. Provide literacy activity designs that are based on these research findings,
4. Provide activity templates to facilitate early literacy development in immersion kindergarten classroom.

This chapter reflects on the implementation of some but not all of the materials designed in this project in the immersion classroom. The feedback came from different perspectives, including those from the teacher and from the students, but not from the parents this year. The overall results for the materials used to date are positive. The materials designed include practices and activities following the development in the order of: 1) oral language; 2) visual skills; 3) character-level; 4) text-level.

The results from the use of the materials and activities designed in this project supported and met the research findings. The students had opportunities to focus on oral language skills when the concept of print was first introduced. The character flash cards helped strengthen their visual skills. The writing process began with the use of large-sized outlined characters. The students had time to explore these characters through playful activities that require large-muscle skills. The character tracing was guided practice and the stepping stone to help students develop and build the required small-muscle skills for writing independently. The space provided for independent writing was adequate for the majority of the students. The students finally applied the characters in reading sentences and short texts.

The challenges faced this year will be addressed during future planning. Parents will have opportunities to help make our learning material and activity kits. More information about home review and practice will be organized to boost the classroom and home connection for parents.

Even though many activity designs have been completed for use, the adjustments and expansions will still be our continuous effort in the future as our program expands. The significant indicators for literacy success in reading Chinese will be considered and implemented when designing age-appropriate materials and activities for our future students in different grades. The goals also include preparing more activities for students to use independently, both at school and at home. The implications of the findings in this chapter for education and future research are discussed in the next chapter.

Chapter 5 Conclusion

5.1 Chapter Overview

The purpose for this study and project is to develop age-appropriate literacy activities for Chinese Immersion kindergarten classes. The research and the project have included:

1. Summarize the history of immersion education in the United States and the national initiatives that helped accelerated the recent growth in immersion programs with some challenging issues immersion programs are facing,
2. Provide fundamental background information in Chinese literacy development, including factors that predict success in naming Chinese characters and reading fluency,
3. Provide literacy activity designs that are based on these research findings,
4. Provide activity templates to facilitate early literacy development in immersion kindergarten classroom.

This chapter addresses the implications from the findings summarized in the previous chapter. It will include suggestions of specific adjustments and modifications of current immersion designs for future reference. It will also introduce routines designed for home review that parents and students can incorporate to support learning at school.

5.2 Adjustments and Modifications for Future Use

From the classroom teacher's feedback and the responses of the students, the materials and activities (See Appendices) created from this study and project have met the age-appropriate criteria and produce positive learning outcomes. The teacher and I have discussed and brainstormed about possible adjustments and modifications to address the challenges faced thus

far. We hope to be better prepared in providing more efficient routines with abundant prepared materials from the start of the school year.

The materials for many activities have been made this year, such as character flash cards, one handwriting booklet and many short texts. We will be able to prepare more if not all materials ahead of time. We will enlist help from parents to help us complete the preparation tasks. From our implementing experience this year, the following ideas are what we have decided worth trying.

5.2.1. Character flash cards.

There were two sets of character cards for teacher use and one table set ready at each group this year. The two sets for teacher use worked well and no additional set is needed for next year. The table sets for students were well-received and additional sets made for the future year will provide even more practice opportunities.

One additional table set for each table group is suggested for next year. At the beginning of each quarter, the characters already introduced during previous quarter can be collected and stored at a different location in the classroom. Students should still have easy access to use these character cards during free time. Only the current character cards will be at the table groups. Too many items in the table supply box can be overwhelming and not effective for the students to find the items they wish to use.

The individual set that was not made for students this year due to limited preparation will be remedied from the start of the school year. Additional individual sets will be made as soon as school start. Each student will have an individual set to use at school. The individual sets should be stored in separate bags labeled with students' names. Students can combine multiple sets to use for different games. The teacher (or teaching assistant, volunteer, etc.) should practice the

sorting and organizing routine with the students. The combined sets for games should be separated after each use and stored accordingly in prepared bags for future activities. An additional set should be prepared for each student ready to be sent home for reinforcement. We have an incentive learning program designed for next year to encourage mastery learning. Students can "earn" a character when they are able to consistently read the character correctly for three consecutive days. There will be "Character Award Ceremony" at the end of the school day. Students achieving the mastery will be able to take the earned characters home for continuous review and practice.

The character-level activities listed in this project have been focusing on learning and practicing. Additional activities for reviewing more characters at the end of each quarter are organized in Appendix N. Each table group has two table sets and multiple individual sets and the teacher can decide which sets of character cards to use for these activities. Since the students will have more practice with writing characters by the end of each quarter, some of these review activities include writing. Students with emerging writing skills can use the individual cards to replace the writing in the activities listed in Appendix N.

5.2.2 Handwriting booklets.

The handwriting booklets were designed before end of the 3rd quarter. The teacher requested to have the 3rd booklet printed ready for trial use in the 4th quarter. The teacher and the students all enjoyed the layout. The booklets were used as an independent center activity. The use of these booklets relieved the teacher constant preparation and save a lot of instructional time needed for giving directions if different activities were to be used. Some adjustments for the 3rd booklet has been made for next year to accommodate the emerging writing skills. Students will

have pages for creative writing and can draw pictures to help expressing their thoughts and ideas. These writing pages can provide opportunities for recording interdisciplinary learning results.

Two of the 40 students (5%) had minor difficulty when the characters were more complex. Additional practices pages with bigger writing space will be created to address the emerging motor skills. These differentiated materials will not be bound into booklets at this time as most students were able to use our current design. Individual pages can be generated to accommodate the need in transitional practice and printed for students as needed.

5.2.3 Short texts.

The short texts are more difficult to read than the sentence strips created by the teacher. The teacher includes visuals when they practice the sentences as a group and remove the visuals later when students are reading better. Since the sentences are short and could be easily memories after a few repetitions, the students will still be able to "read" most of the texts when unfamiliar characters are included. The intention for these short texts is for students to see familiar characters used in different contexts. More oral expressions are included in these short texts to begin introducing more characters and more complex characters.

The materials for each short text include many sets of character cards in different sizes, sentence strips, and pages with full text. The preparation of these materials requires more time. The materials also need to be sorted and organized into learning kits. Once the learning kits are prepared, they can be used for may differentiated activities. There are various sizes of character chards included in these short texts for teacher and students depending on the configurations of group sizes. There are also different types of activities within each short text (see the details in Appendix M). The activities can be made ready for checking out after students meet the learning objectives. These are for optional practice and can be handy as differentiated materials for

students who have developed more advanced skills. The teacher can introduce the activities and practice the steps with the whole group with the easier and short passages. The activities can be made ready and stored in large zipped bags. Students should have easy access to these materials. The activities can be sent home for additional practice at home when students are able to use them independently in the classroom.

The teacher suggested adding small visuals to these short texts to increase understanding. The short texts with visuals are great medians to independent learning and success (Curtain & Dahlberg, 2016). Then they can use the texts without visuals for challenge. The teacher plans to make binders consist of these short texts and keep the binders at the table groups. Students can flip through different pages looking for the characters they know when new characters are introduced and will have the opportunity to read any portion on their own. Multiple versions of the same text could be beneficial and convenient for differentiation and reinforcement purposes.

Some of the short texts consists of characters taught in different quarters, these will be more suitable as review practice toward the end of the school year. Several short texts can be used in the same review activity with the whole class. All students can be engaged and moving about in the classroom while reading different sentence strips. Students can pair up to participate in the activities to reduce any possible anxiety during participation since the purpose is active learning with reading practice. Complete texts can be taped to different table groups. Student will move around the classroom to find which group their sentence strips belong to and then put the sentences in the correct order.

5.3 School and Home Connection

The Chinese immersion educational materials designed this year were only used by the teacher and the students in school. The goal is to practice the routines with students until they

are able to use the materials independently and also become very familiar with the content before the materials are sent home. It can be discouraging for students to take home any materials they have not yet mastered. Directions in English could be helpful and included for parent use. There is also plan to create a 3rd version of the short text with Pinyin and English translation for parents' reference. Many parents have inquired about possible Chinese classes for adults. We have been contemplating more information sessions for parents to support their understanding of Chinese language and culture in general.

Enrollment for our program is determined by a school district lottery process and most families come from outside of our school neighborhood. Parents are required to provide their own transportation. A "Chinese Leaning Kit on the Go" for parents to keep in their car for students when they commute can perhaps boost some additional learning without impacting family time or other extracurricular activities. The learning kit can be any container that will keep needed materials organized in the vehicle. The materials can include character cards, basic stroke types page, and a handwriting booklet. Sentences and short texts can be added to the collection as students are able to read independently. Keeping learning materials organized in compact manner and handy for use during transit time can encourage additional practice outside. A learning log can be part of the kit for students to track their practice time.

5.4 Activity Collections for Future Teachers

As mentioned in the earlier chapter, teacher recruit and retention are challenging for many programs. The consistency in instruction can be interrupted when there is personnel change from time to time. ASD has been a Google Apps for Education (GAFE) district for more than a decade. ASD has been creating academic plans for all subjects and grades for many years. Keeping all materials accessible for every teacher is the ultimate goal. In the past two years,

most academic plans have been gradually added to the ASD's Google site for all teachers. This online resource is convenient for teachers to access from any location with any devices. The Curriculum and Instruction Department and all the teacher experts continue to update the academic plans on regular basis. The current Chinese materials master files are uploaded to the World Languages Department's shared folders. This process saves time for the teacher to transfer files back and forth. Once any revision was made, the outdated items are immediately replaced. As our Chinese Immersion Program continues to expand, using Google folders will ensure the material organization and other documentations are consistent and current.

5.5 Digital Learning in the Future

Better Immersion has digital learning available with additional purchase. Due to limited budget, we are not able to offer the accounts to all students this year. Currently, not all of the enrolled families have Internet service available for students e-learning at home. The school district and individual schools are constantly exploring possible grants and funding to provide more technology in school. The future goal is to equip each student from kindergarten to grade 2 with a tablet for digital learning, both at school and at home. The Better Immersion online accounts will be added as soon as our program can afford to support it.

In the process of creating the handwriting booklets, I have drafted a running record to keep track of the students learning. The idea is to record the mastery of characters in a booklet form and keep in the student's school record. This running record will save teachers time in initial assessments for devising individualized learning plans for the students. This running record can be easily formatted and made available to individual students. They can become mastery review materials or even as personalized dictionary for students.

The collaboration of teachers has become more digitalized in the ASD in the past few years. More and more professional developments are focusing on offering technology related trainings. ASD's Educational Technology Department has been exploring options for teachers and training teachers to utilize more digital tools in classroom learning. Our Chinese curricula have only been in the trial stage for a year. We plan to make the materials available to students and parents through possible online learning platform. Materials used in this project are created digitally and later expansion will all be digital. We would like to have another year to work on needed modification before sharing these with students and parents through the students' Google accounts. We already begin to address the need of more information sessions for parents. We are considering developing our own readers in digital forms and share them with parents. The digital learning will be included in our planning and promoted in parent information sessions. The ultimate goal is to offer access to learning at any time and from any location.

5.6 Alternative Assessments and Learning Portfolios

In an immersion classroom, the teacher provides authentic experiences for students to learn cognitively-appropriate contents and acquiring the target language. The language is contextualized through careful designs. The students' proficiency in the target language gradually increase over time when they also develop competency in contents. Both formative and summative assessments are crucial in providing the most effective and timely learning to all students (Tollefson et al., 2012). The early learning of a new language relies on rote memorization and is often rehearsed. Teachers can use different observation checklist to document students learning in natural setting. Students oral language are at a novice level and they are not able to use the target language yet to elaborating their learning at this early stage.

Their work samples are more authentic learning results that can be organized into portfolios as summative assessments to reflect their learning.

5.7 Final Conclusion

The purpose for this study and project was to develop age-appropriate literacy activities for Chinese Immersion kindergarten classes. The complete work includes:

1. Summarize the history of immersion education in the United States and the national initiatives that helped accelerated the recent growth in immersion programs with some challenging issues immersion programs are facing,
2. Provide fundamental background information in Chinese literacy development, including factors that predict success in naming Chinese characters and reading fluency,
3. Provide literacy activity designs that are based on these research findings,
4. Provide activity templates to facilitate early literacy development in immersion kindergarten classroom.

Through the research in this study, different types of materials and activities were created over the course of a school year. The research reviewed on significant factors necessary for learning to read Chinese are the foundation of my designs. These factors include visual skills, RAN speed, morphological awareness, and orthographic skills. This project took consideration of young immersion students with no prior Chinese language background and created age-appropriate and student-centered activities preferred in the United States. The developmental and emerging literacy skills and indicators for success in reading Chinese were incorporated into the designs. The most considered factors for current designs are the visual skills and orthographic skills. Materials completed in this project are larger in scale compared to the

purchased material for our program. The materials created for this project meet the criteria that young children learning to read Chinese characters stay in the visual stage for a longer period of time compare to children learning to read in an alphabetic language. The writing activities provide clear visual directions for students to first decompose characters into basic strokes before they reconstruct the strokes to form the characters. Even though more experienced Chinese readers process bigger components in characters, strokes are considered the least significant from studies reviewed. Since kindergarten students only begin learning basic concepts about the language when they enroll in the program, the stroke types and fluency in how to write the stroke shape correctly become our current focus. Instruction and activities designed in the future for students in higher grades will definitely require character structure analysis. Explicit instructions of components within characters will be the essential part of our planning in order to achieve higher learning outcomes.

Due to the students low language proficiency and still at the beginning stage of learning both spoken and written Chinese, this project does not include activities related to morphological awareness. However, rhe future instruction will include visual presentations of homophones to assist students in expanding their morphological knowledge. RAN fluency probes are designed in this project but also not used this year. My hypothesis of using short character probes similar to the RAN tests (based on the RAN processing theory) for practicing familiar characters for fluency purpose is untested. We would like to introduce the RAN character reading practices for the future, including students in higher grades. These probes made with 25 characters (or maybe more in the future for higher grades) will not require of time to prepare and can be easily tailored for individual students. The students can be trained to use these probes to practice and monitor each other. The practice probes require very little time. Students can work with any partners

any time when they finish work early. Data will be collected for analysis to determine whether the hypothesis of using these probes can assist students achieve mastery and fluency in reading.

This was the first year of the Chinese immersion program implementation and our department includes only four certificated Chinse teachers. The kindergarten teacher and I worked closely together to address challenging issues in modifying materials. I created materials and designed activities in the background while the teacher tried the materials and activities with students. The feedback from the teacher was essential for me to continuously adjust and modify the materials and activities. We will continue testing the designs and gather data for future reference. We will continue expanding our collection of activities and materials for sharing with new teachers in our program.

Many of these activities are suitable for different grade levels. The instructional time can be saved using activities that the students are already familiar with. The current designs in materials and activities can be used as templates to accommodate different contents. Using these templates can save teacher time from making the materials from scratch. Future teachers in our immersion program will be encouraged to contribute to the adaptation and modification of our learning materials and activities. This is a collective project that can ensure the consistency in the instruction of different grades. It is also an important cornerstone for building a strong and coherent program. We would like to share and exchanges our experience and materials with other programs of similar design and philosophy.

5.8 Personal Reflection and Future Direction

This study and project can be summed up as a challenging and rewarding learning experience for me. I am very grateful to have this opportunity to combine my K-8 teacher training and the previous study in Teaching English to Speakers of Other Languages to create the

materials and activities for our Chinese Immersion Program. The initial research was difficult but still my favorite part of the process. Finding and reading the research and studies opened up my mind to examine a language I have learned but never really studied. It was stressful at first when I was at a loss in finding relevant research. It was not easy to read let along understand technical terms in most of the research at first. I am very proud that my persistence in rereading the research many times finally paid off. Small glimmers of understanding sparked and lead to better understanding for me to solve the puzzle. The research process became easier and later yield abundant of results. The difficult choice became when to stop and only focus on the most relevant. I finally made peace to set many research and studies aside for future reference.

The academic advisor and the Master of Arts Program (MAP) director, Karen McCain, Dr. G. A. Page, and the MAP participants provided meaningful feedback on my presentation of my study and project. Their questions lead to more research to refine my project. The Chinese Immersion teacher had offered her time and trust to test the materials and activities created in the project. The valuable feedback from the teacher was essential for me to adjust or redesign the materials and activities since I was not working directly with the students. I would love to be able to arrange time to observe how the materials and activities are used in the classroom next year. I think it will provide valuable insights for future designs.

M journey in this path of exploring and creating effective designs have just begun. I hope to work even more closely with future teachers who are joining us to build the program. Creating a supportive and sharing working environment for teachers is just important as creating materials and activities for boosting students learning!

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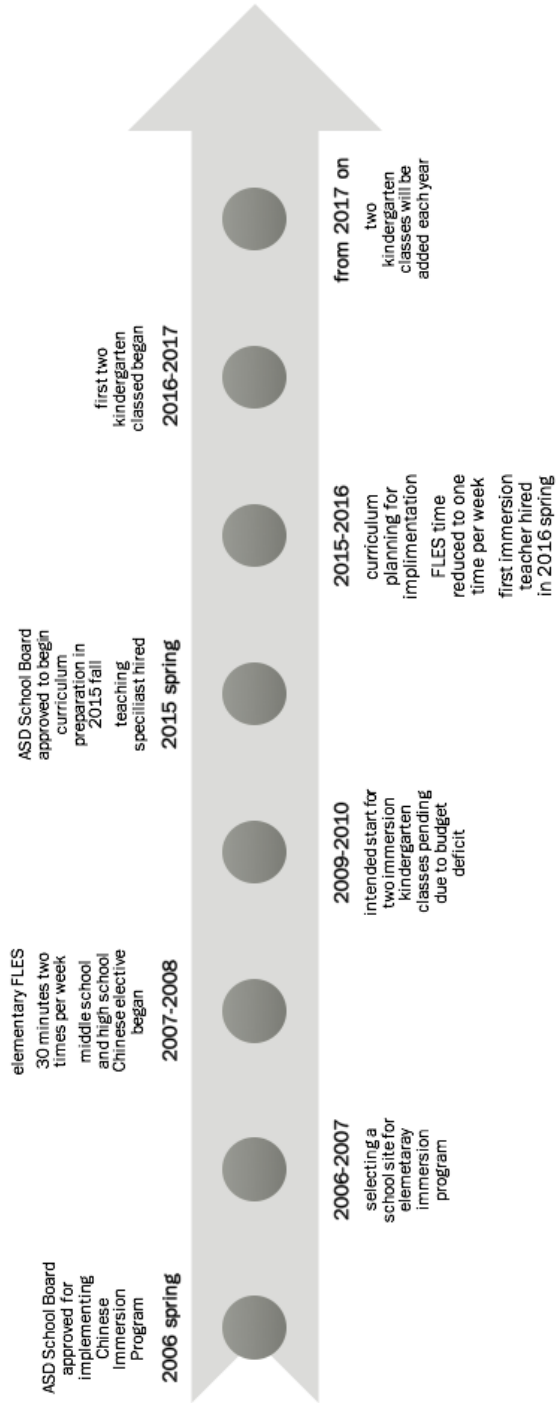
Yeung, P., Ho, C. S., Chik, P. P., Lo, L., Luan, H., Chan, D. W., & Chung, K. K. (2011). Reading and spelling Chinese among beginning readers: What skills make a difference? *Scientific Studies of Reading, 15*(4), 285-313. doi:10.1080/10888438.2010.4821

Appendix A

Anchorage School District (ASD)

Chinese Program Implementation Timeline



Timeline created by Robyn Lin in 2017, with archived information from ASD.

Appendix B

Chinese Characters & Connected Text Samples

1. Chinese Characters with Different Stroke Counts

All the characters below should occupy the same size of space in the printed or hand-written text they appear. The strokes (lines) in characters with fewer strokes are longer and less crowded when compared to the characters with more strokes.

一	二	三	心	玉	竹	見	金	面	骨
1 stroke yī one	2 strokes èr two	3 strokes sān three	4 strokes xīn heart	5 strokes yù jade	6 strokes zhú bamboo	7 strokes jiàn to see	8 strokes jīn gold	9 strokes miàn face	10 strokes gǔ bone
魚	黃	鼎	鼻	齒	龍	龠	簡	識	覺
11 stroke yú fish	12 strokes huáng yellow	13 strokes dǐng cauldron	14 strokes bí nose	15 strokes chǐ tooth	16 strokes lóng dragon	17 strokes yuè flute	18 strokes jiǎn simple	19 strokes shí/zhì knowledge	20 strokes jué to feel
鐵	鞨	體	鱣	黌	黶	黷	鸚	鬱	鱻
21 stroke tié iron	22 strokes jiān saddle-cloth	23 strokes tǐ body	24 strokes shàn sturgeon	25 strokes hóng school	26 strokes yǎn black spots	27 strokes nóng head cold	28 strokes yīng parrot	29 strokes yù luxuriant	30 strokes xiān fresh
灪	龖	麤	猋	鼻	靐	龘	龍龍 龍龍		
31 stroke yàn billowing	32 strokes tà flight of dragon	33 strokes cū rough	35 strokes yà lacking teeth	36 strokes nàng blocked nose	39 strokes bìng	48 strokes tà	64 strokes zhé talkative		

2. Connected Text Sample

The following is a short text sample. There is no space between each character. Chinese punctuations are different than what are used in English.

汉字有长达数千年的发展和演变的历史过程，大致是：商代之前为起源史，殷商甲骨文为成熟期。此后出现一系列演化，特别是到了汉代，隶书取代小篆成为主要字体，中国文字发展历史就脱离古文字阶段进入隶楷阶段；楷书到隋唐基本定型，在宋朝刻印的书籍中被美术化成为「宋体字」，后有模仿宋体字而来的仿宋体，大体就是我们今天所用字体。

This text about history of Chinese writing is retrieved from http://baike.baidu.com/item/中国文字史

Appendix C

A Schematic Summary of the Approximate Relationships between Different Stage/Phase Theories of Learning to Read

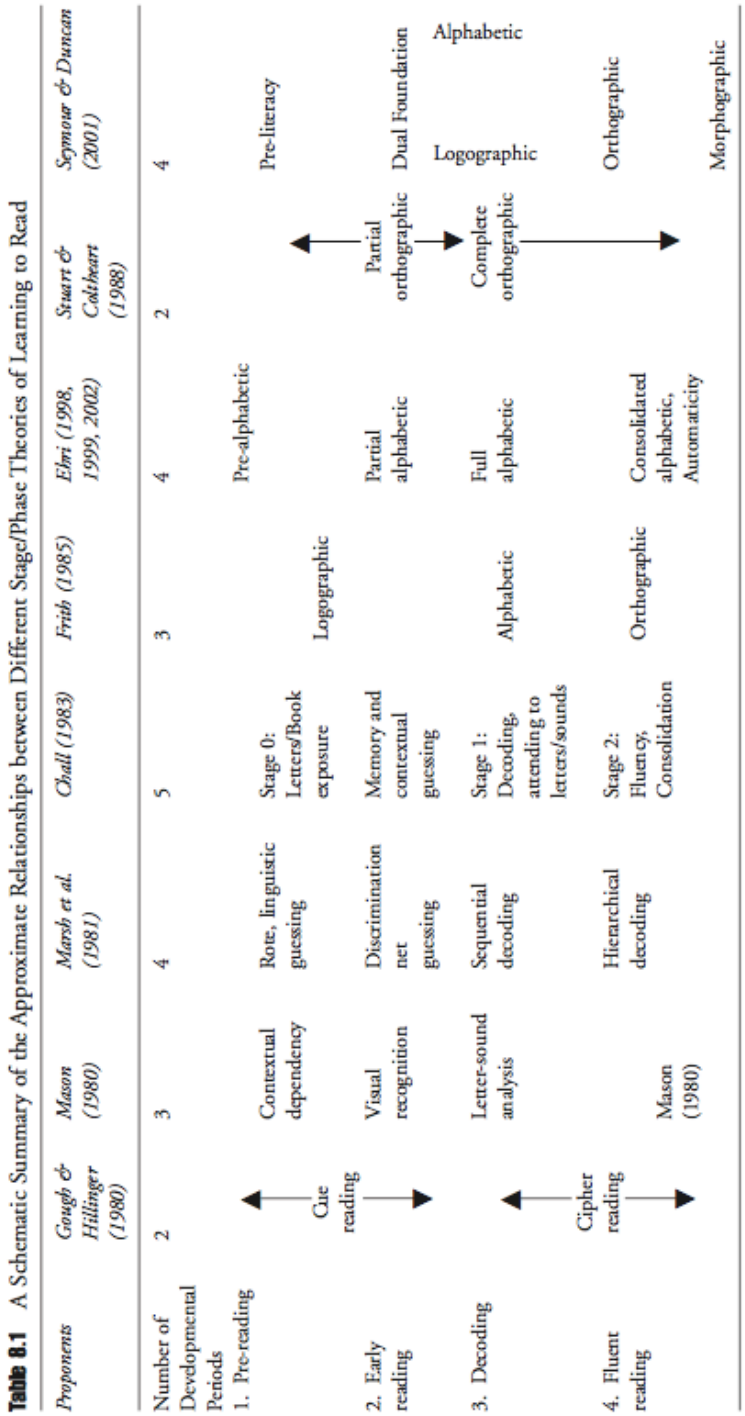


Table 8.1 A Schematic Summary of the Approximate Relationships between Different Stage/Phase Theories of Learning to Read

Proponents	*Gough & Hillinger (1980)*	*Mason (1980)*	*Marsh et al. (1981)*	*Chall (1983)*	*Frith (1985)*	*Ehri (1998, 1999, 2002)*	*Stuart & Coltheart (1988)*	*Seymour & Duncan (2001)*
Number of Developmental Periods	2	3	4	5	3	4	2	4
1. Pre-reading	← Cue reading	Contextual dependency	Rote, linguistic guessing	Stage 0: Letters/Book exposure	Logographic	Pre-alphabetic	← Partial orthographic	Pre-literacy
2. Early reading	→	Visual recognition	Discrimination net guessing	Memory and contexnual guessing		Partial alphabetic	→	Dual Foundation
3. Decoding	← Cipher reading	Letter-sound analysis	Sequential decoding	Stage 1: Decoding, attending to letters/sounds	Alphabetic	Full alphabetic	Complete orthographic →	Alphabetic / Logographic
4. Fluent reading	→	Mason (1980)	Hierarchical decoding	Stage 2: Fluency, Consolidation	Orthographic	Consolidated alphabetic, Automaticity		Orthographic / Morphographic

(Ehri, 2005)

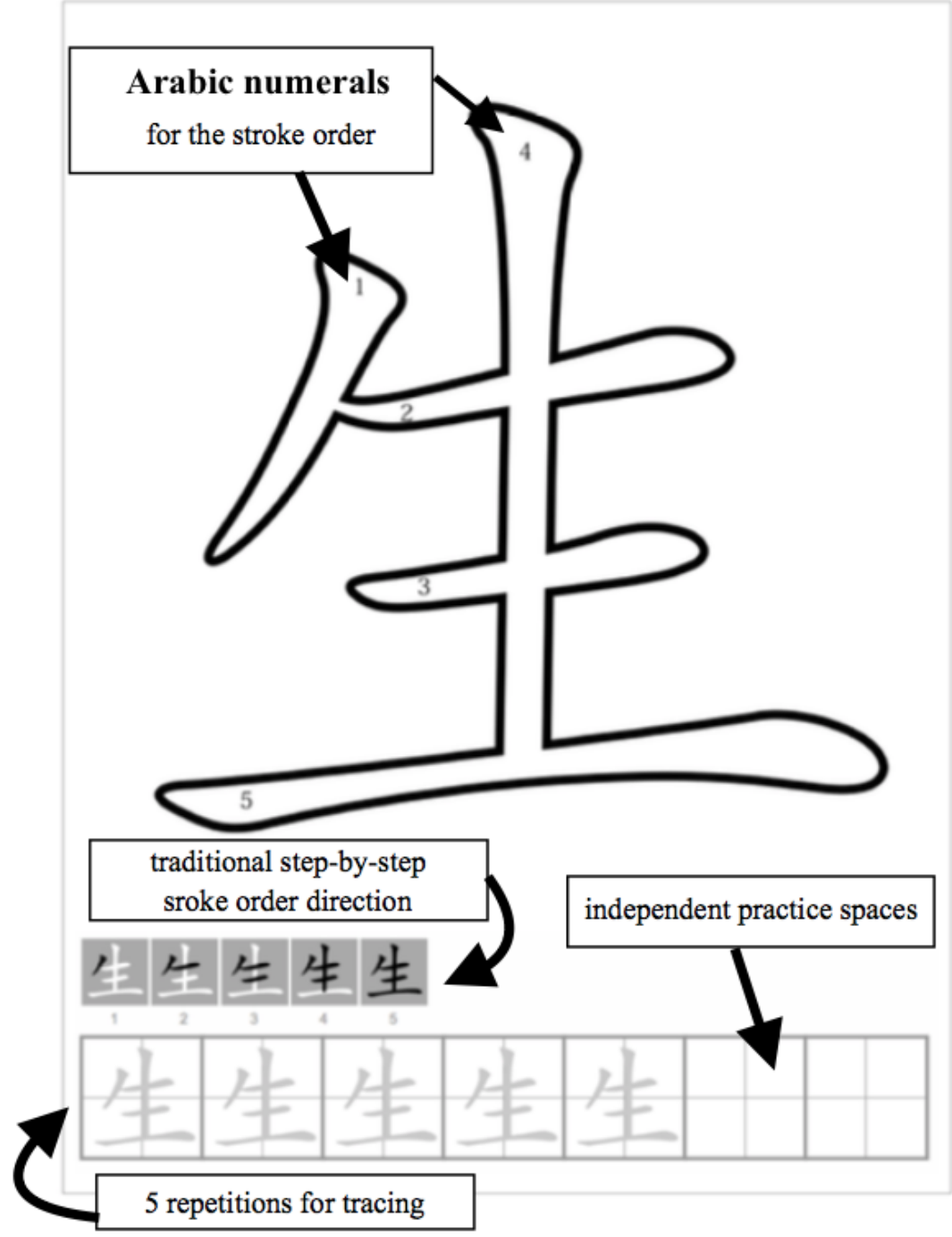
Appendix D

Summary of the Experiments by Anderson et al. (2013) Learning to See the Patterns in Chinese Characters.

	Experiment 1	Experiment 2
Location	Beijing	Beijing
Students	50 late second-semester of the school year first graders divided into three reading proficiency level by teacher (low, middle, high)	Late in the first semester of the school year 2 classes in Grade 2, n=40 2 classes in Grade 4, n=47 2 classes in Grade 6, n=54
Delay Copy Character Task	2 second delay; 40 characters from 5 types of characters; 8 characters in each type 1. familiar simple characters, selected from first-grade Chinese language textbooks, each of which is an integral whole that contains no components or subcomponents, 2. familiar compound characters, also selected from first-grade textbooks, which contain two familiar components, 3. unfamiliar characters that consist of two familiar components appearing in their typical positions, 4. unfamiliar characters that contain at least one unfamiliar component, 5. noncharacters that consist of two familiar components appearing in illegitimate positions.	2 second delay; 50 characters from 5 types of characters; 10 characters in each type 1. familiar simple characters, selected from first-grade Chinese language textbooks, which were integral wholes not divisible into components or subcomponents, 2. familiar compound characters, also selected from first-grade textbooks, compris- ing two familiar major components, 3. unfamiliar characters comprising two familiar major components appearing in their typical positions, 4. noncharacters comprising two familiar major components appearing in illegitimate positions, 5. arbitrary stroke configurations that looked more or less like characters.
Detect Component Task	18 sets of 75-characters tests; each set has a target component; 3 different types of components; 6 sets of characters in each type; detect and circle the component 1. familiar major components—simple characters that serve as semantic or phonetic radicals of compound characters, 2. unfamiliar major components—simple characters not yet taught in school that serve as semantic or phonetic radicals of compound characters, 3. familiar subcomponents—recurrent patterns in characters known to first graders that can- not appear independently as characters and always have to combine with other subcomponents to form semantic or phonetic radicals.	24 sets of 75-characters tests; each set has a target component; 4 different types of components; 6 sets of characters in each type; detect and circle the component 1. familiar major components—radicals or phonetics known by the children, 2. unfamiliar major components—radicals or phonetics not known by the children, 3. familiar subcomponents that do not appear independently as characters and must combine with other subcomponents to form major functional components, 4. stroke patterns that cross the boundaries of major constituents and that are, thus, arbitrary.
Additional Tasks	NA	Reading comprehension tests • for Grade 1 and Grade 2: 25 grade-appropriate sentences; select 1 from 4 pictures best represent the meaning of the sentence • for Grade 4: read 3 passages; answer 11 multiple-choice questions Vocabulary test • for Grade 1 and Grade 2: character recognition • for Grade 4: vocabulary checklist

Appendix E

Chinese Character Introduction Worksheet



The actual worksheet is slightly larger than the example provided in this page. The outline of the sample provided here is ¼ of an inch from the edge of the letter size (8.5 x 11) paper.

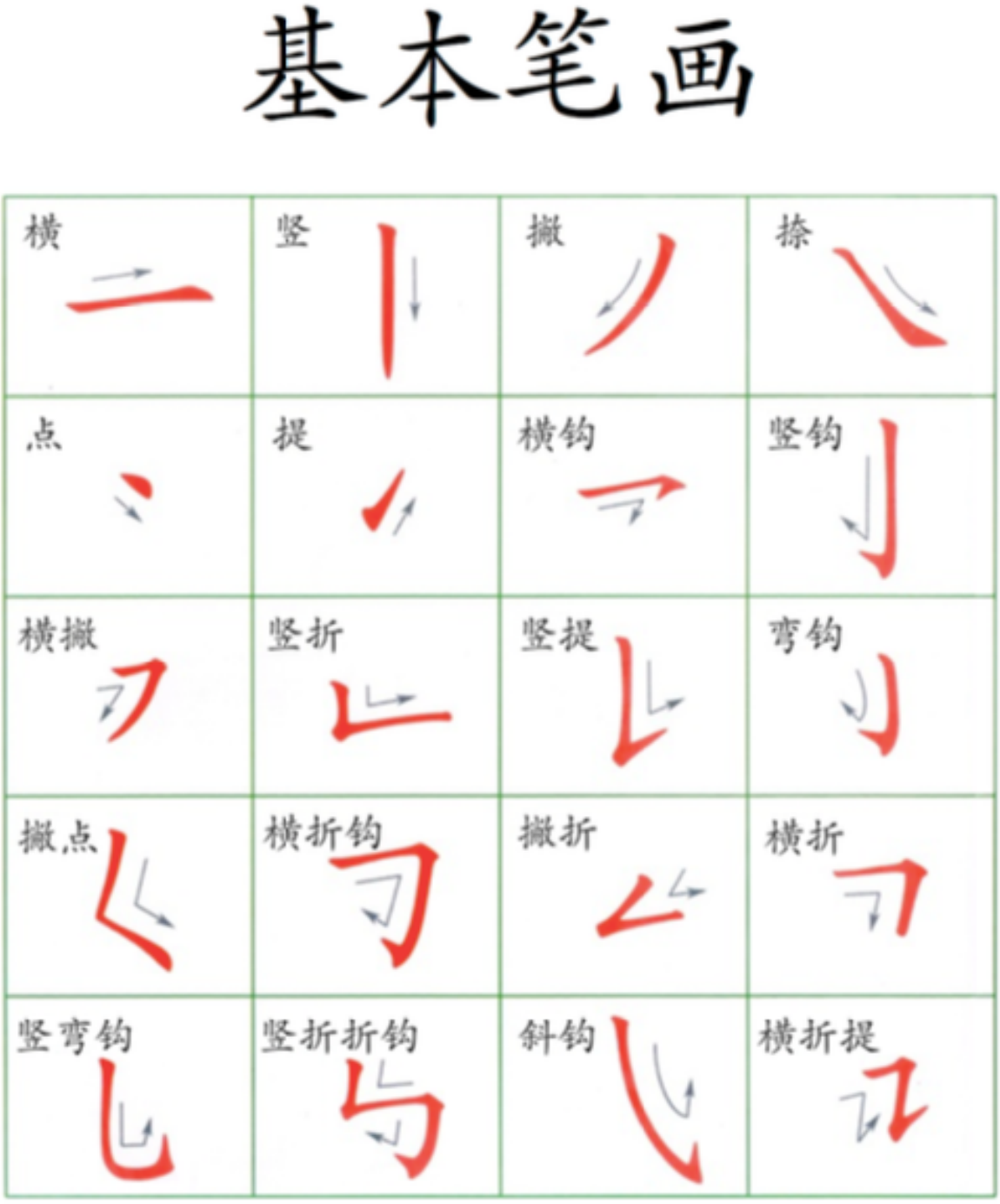
Appendix F

Suggested Activities for Character Introduction Worksheets

Material	Suggested Use
Dry erase markers	• Draw a picture of what the character represents. • Color in each stroke by order. • Write inside the outline by order. • Trace the smaller characters in the writing spaces below. • Try to write the characters independently.
Play dough	• Use small pieces of play dough to cover each stroke by order. • Make a long rope and pinch off matching length for each stroke. Place the playdough pieces in the character outline or make a separate character on a different play-mat.
Goldfish snack	• Line up the Goldfish snacks in the outline. • The fish should "swim" from the beginning of the stroke indicated with Arabic numerals to the other end.
Pipe cleaner with a small bead on one end	1. Prepare different colors of pipe cleaners and attach a small bead on one end. 2. Ideally, there should be as many colors as the highest stroke number students are learning. Each color should include several different lengths for students to choose in order to match the lengths of different strokes. 3. Colors are assigned to be used to coordinate with the stroke order, 1-red, 2-orange, 3-yellow, 4-green, 5-blue, 6-purple, 7-black, 8-white, 9-pink, 10-brown. This also reinforce the colors the students are learning. 4. This is helpful to show students that some strokes change directions. These strokes are made with one continuous line, such as ㄣ, ㄱ, ㄴ.
Yarn	1. Cut pieces of yarn to match the length of each stroke in the character. 2. Put a character and the pieces of yarn in a plastic bag. 3. Student will match the yarn pieces to the strokes. 4. The student can try to construct the character in the character outline or on a different surface.
Pattern blocks	• Use pattern blocks to cover the strokes in order. • Students can use one particular shape for the whole character or make patterns for each different stroke. • Student can work alone or with one or more partners.
Other small objects	• Following the stroke order, students can use any small objects and be creative about how to finish the task.

Appendix G

20 Basic Stroke Types



http://happycottagesg.blogspot.com/2011/05/basics-about-writing-chinese-characters.html

This resource is found on the Happy Cottage website (used with permission.)

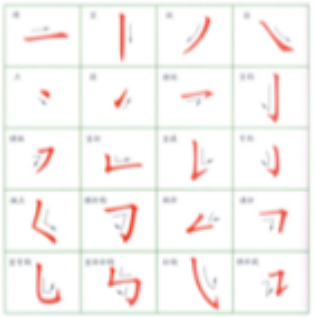
http://happycottagesg.blogspot.com/search?q=stroke+order

Appendix H

Directions for Handwriting Practice Booklet

汉字练习规则

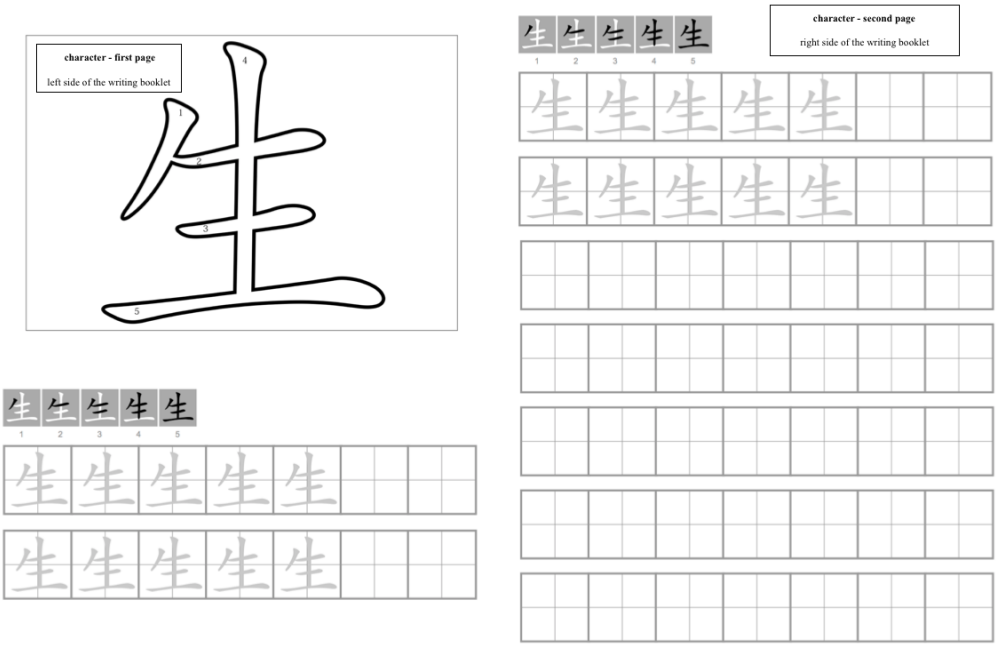
一. 先练习基本笔画。



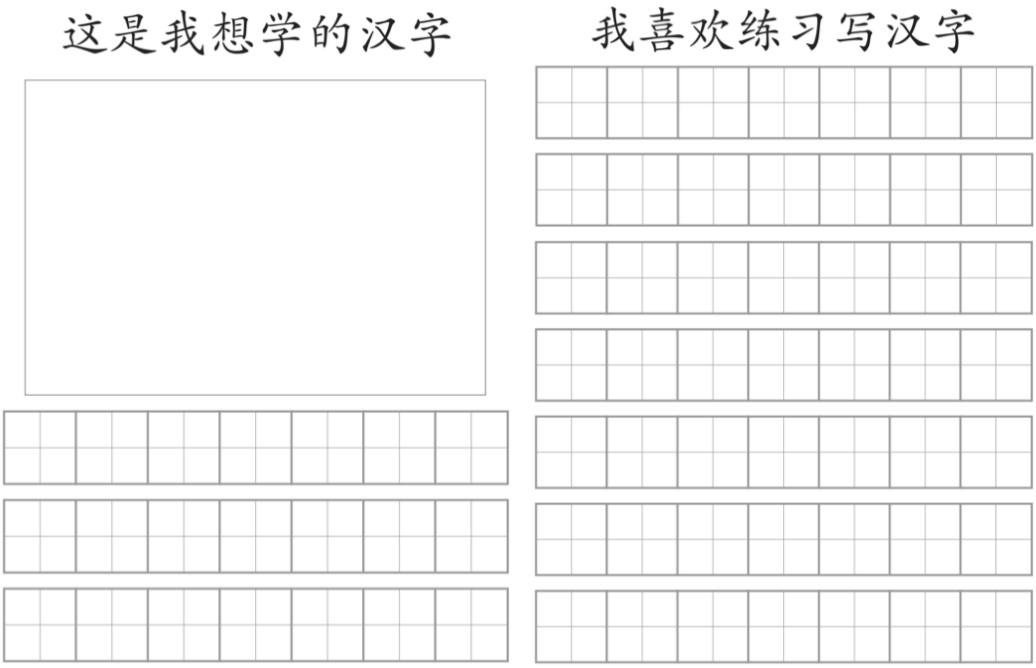
二. 看一看笔画顺序。

三. 按照正确笔画练习。

Appendix I
Handwriting Booklet Sample Pages



Above: pages with characters



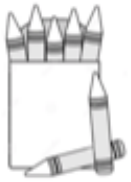
Above left: for additional character students want to learn on their own
Above right: spaces for any additional practice students would like
Actual size for each page is bigger than the samples shown (fit 8 ½ “x11” letter size page with about ¼’ margin).

Appendix J

Character Mastery Record Page in Handwriting Booklet

我会写的汉字

学会了，涂上漂亮的颜色！



一	二	三	四	五
六	七	八	九	十
人	口	手	大	小
日	月	山	天	上

This page is from Kindergarten Handwriting Booklet 1.

Actual page is bigger than the sample included here.

Appendix K

Character Naming Practice Sample Probes

The following are sample probes for number characters. The blue characters on the top are mastered and the red character added are newer character mastered at a later time. Some probes have more than 3 characters for differentiation purpose.

一 二 三	二 三 四	二 三 四 五	三 四 五 六	四 五 六 七
一 二 三 二 一	二 三 四 二 四	三 五 四 二 五	三 五 六 四 六	五 六 四 七 六
三 一 二 一 三	三 二 四 三 二	四 三 五 二 三	五 四 三 六 四	七 四 七 六 四
二 三 一 三 二	四 二 四 二 三	五 三 四 三 二	四 五 六 四 三	四 五 六 四 七
一 二 三 一 二	二 四 三 三 四	三 五 二 四 三	六 五 三 四 五	六 五 七 四 五
二 一 三 一 三	三 四 二 四 三	四 三 五 二 五	三 四 六 六 三	七 四 五 六 七
五 六 七 八	**六 七 八 九**	**七 八 九 十**	**一 三 五 七 九**	**二 四 六 八 十**
八 六 五 七 六	八 七 六 七 六	八 七 十 七 九	三 七 九 五 一	四 八 六 十 二
七 五 七 六 八	九 八 九 六 七	十 七 五 九 七	九 三 一 七 五	二 六 四 八 十
八 七 五 八 七	六 七 六 九 八	九 八 八 七 十	五 一 七 三 九	十 四 八 二 六
七 五 七 八 六	六 八 九 八 七	八 七 十 九 七	七 五 九 一 三	六 八 二 四 十
八 六 四 五 六	七 九 九 六 八	七 十 八 十 九	一 九 七 三 五	八 二 六 十 四

The following are sample probes with only three characters each. Orders of the characters are changed in each probe to provide variations. Each probe can be numbered for organization purpose if desired.

手 大 小	手 小 大	小 手 大
大 小 手 小 手	小 手 大 小 手	手 大 小 手 大
小 手 大 小 手	手 小 手 大 小	大 小 手 小 手
手 大 小 手 大	手 大 小 手 大	手 小 手 大 小
大 小 大 手 小	大 小 手 小 手	小 手 大 小 手
手 小 手 大 小	大 小 大 手 小	大 小 大 手 小

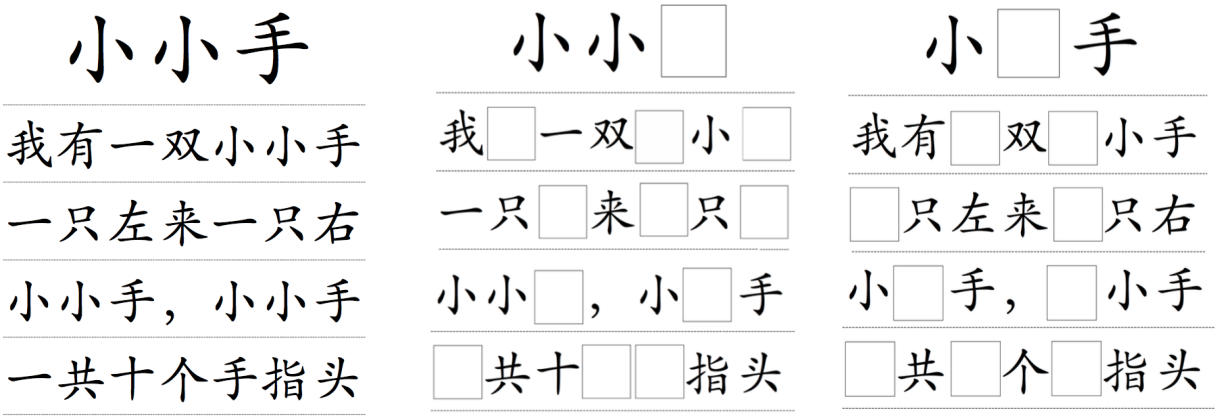
Appendix L

Suggested Activities for Sentence and Short Texts

Activity	Materials	Directions
Correct order	• Complete text • Cutup text pieces (character cards, phrases, sentence strips)	1. Print out two copies of the complete text (song, rhyme, or other text). 2. Cut the text into smaller parts, such as phrases, sentence strips, or individual character cards. 3. Provide a copy of the complete text and the cutup text pieces in a bag. 4. Students can take a bag and work alone or with others to put the text pieces in order.
Missing characters	• Song or rhyme text (some characters missing) • Protector sheets • Character cards • Dry erase markers	1. Print out the text with some characters missing. 2. Prepare missing character on small cards that will fit into the spaces of missing characters of the text page. 3. Place the text page in the protector sheets. 4. Students can choose to use the character cards for the missing part or they can use the dry erase marker to write the missing characters.
Matching	• Text cut up into smaller parts • pictures corresponding to the text	1. Print out the text. 2. Cut the text into smaller parts. 3. Find some small pictures that match the text. There could be many pictures to each text part. 4. Students match pictures and text parts .
Mini book illustration	• A page of the text • Print parts of the text on different pieces of paper	1. Students illustrate on the pages with parts of the text. 2. Use the complete text as reference to assemble the mini book.
Team work	• A page of the text • Individual character cards for the whole text	1. One or more students can use this activity. 2. Distribute all the character cards evenly to all the participants. 3. The student with the first character of the text will begin by placing the character in the center of the group. Students will paly “rock, paper, scissors (in Chinese) to determine who is the first if more than one has the same character as the first character of the text. 4. Student will take turns in clockwise order. Students will have to pass their turn if they do not have the next character of the text. 5. First students who finishes their character cards first is the winner.

Appendix M

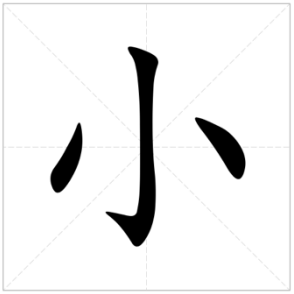
Short Text Sample Activities



full text | **Missing Character 1** | **Missing Character 2**

---

set 1

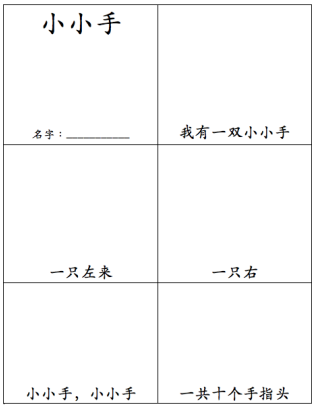


set 2

set 3

set 4

Various sizes of character cards for the short text activities. Actual size for each set fit letter size paper 8 ½ "x11". These character cards are generated by using a website, Hanlexon Chinese (http://www.hanlexon.org).



Students draw picture in each box first. Then they will cut on the line and assemble the pieces in order for making a mini book.

Appendix N

Whole Class Character Review Activities

Activity & Materials	Direction
Character Walk • Character cards -teacher set	1. Prepare enough character cards for all the participants. 2. Place all the cards on the floor to form a big circle. 3. Participating students walk along the outside of the character circle while review a chant/rhyme/song. 4. Participants stop when the chant/rhyme/song ends. 5. Each participant turn to a partner and read the character to each other.
Read and Swap • Character cards -table set	1. Prepare enough character cards for all the participants. 2. Give each participants a character card to hold. 3. Participants review chant/rhyme/song or counting while move around the classroom safely. 4. All Participants stop when the chant/rhyme/song/counting ends. 5. Participants turn and find a partner to share their character. 6. Participants exchange character card and continue moving around the room with another chant/rhyme/song/counting.
Character Tic-Tac-Toe • Tic-tac-Toe grid • Small character cards that fits into the tic-tac-toe grid • Two different kinds of markers for two players	1. Prepare the characters and put them inside a bag. 2. Each player takes turn and pull out one character card at a time. Both player need to know the character to keep the character. Put the character card aside if one does not know the character. 3. Place the character inside any space in the Tic-Tac-Toe grid. 4. Plays decide who takes the first turn after playing "Rock, Paper, Scissors!" 5. Players must read the character in the desired space before placing a marker in it. 6. Set aside used characters when a game is finished. Continue setting up a new game with more characters from the bag. 7. Players ask help to review the unfamiliar characters after the known characters are all used. *This activity can be used by students during choice time or with the whole class.
Roll and Write • Dice • Assign6 characters on the top of a piece of writing paper with assigned number for each • Pencils/whiteboards and dry erase markers	1. Students can be in pairs or in a small group. 2. Give each student a piece of the writing paper with review characters printed/written on it. 3. Students take turn to roll the dice and write the character (with the number rolled) on the writing paper. 4. Continue to write until all the spaces are filled. 5. A tally chart can be included in the writing paper for the students to tally how many of each character are written on the page. *Instead of using writing paper, all 6 characters and stroke order direction can be printed on the whole sheet to provide additional help for students as a differentiated alternative. Students will write on the whiteboard instead of on paper.

Contact Information

Please send further questions, suggestions, or comments to Robyn Lin.

robynlinlaoshi@gmail.com