TEACHERS’ PERSPECTIVES ABOUT BRAILLE LITERACY IN TAIWAN

DISSERTATION

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This study investigates the state of braille literacy in Taiwan. Research on teachers’ attitudes and perspectives about braille instruction in the U.S. includes reading medium selection, personnel training, Nemeth code, assistive technology, and beginning/primary braille instruction. Scant literature exists in Taiwan on braille teaching issues, even fewer on teachers’ perspectives of and competency in braille literacy and instruction in classroom settings (Lin, 2002b; Tsai, 2004). This study extends Wittenstein’s (1993b) and Koenig and Holbrook’s (2000c) investigation to the educational context of Taiwan to examine teachers’ braille training experiences and their competencies of and attitudes toward braille literacy related to their instructional approaches.

The research questions guiding this study inquire into the educational backgrounds of teachers of young and beginning braille students in Taiwan, differences and similarities in availability of instructional resources for teachers in three educational programs (itinerant, resource room, and residential school), teachers’ braille teaching strategies and curriculum design, concerns about braille instruction, and recommendations to teacher preparation programs. Mixed methods (document analysis, surveys, and interviews) were used to collect quantitative and qualitative data from 76 in-
service certified teachers in Taiwan who taught kindergarten, first-, second-grade levels, or beginning braille in different educational environments.

The participants agreed braille is an important reading medium and acknowledged the need for more braille knowledge in literary (Zhùyīn) and other braille codes, especially Nemeth code and English braille. Although confident in their skills of teaching braille and determining their students’ reading modes, most did not have enough knowledge of early childhood special education, and their braille curriculum design relied on self-study and advice from experienced colleagues. Most were aware of the increasing use of technology in braille instruction, but were reluctant to use assistive devices to teach young and beginning braille students. Although most agreed with the significance of the Individualized Education Program (IEP) teamwork consisting of vision and regular class teachers, parents, and administrators in students’ braille learning, they did not find the IEP meetings helpful for students. The findings will contribute to research in early braille instruction and to teacher training programs for pre-service and in-service braille teachers in Taiwan.
Dedicated
to my parents,

To my lovely advisor, and

To teachers who burn their own lives
to light the visually impaired students up for their future
ACKNOWLEDGMENT

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FIELD OF STUDY

Major Field: Education for Students with Visually Impairments
Minor Field: Early Childhood Education
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CHAPTER 1

INTRODUCTION

In the modern era, issues related to literacy have typically involved functional concerns, including the implications of being illiterate, the ways literacy has influenced one’s mental growth, and whether literate activities have promoted a young child’s higher inter-psychological development. In practical terms, literacy is essential for one’s successful performance of many daily living skills, for career preparation and opportunities, and for clear expression of one’s ideas and concerns. No matter who, what, and where one is in the highly literate world, literacy definitely plays a significant role in our language-rich world (Nemeth, 1988; Schroeder, 1989; Wormsley, 1997).

Background of the Study

Recognizing the necessity to facilitate the basic literacy capabilities of young students, governmental administrators in the highest levels have prioritized literacy in their educational policies. Theoretically, a government policy is intended to respond to the demands of the public for its welfare. Legislative decision, created by policy leaders in federal and state levels, eventually will directly influence practitioners’ thinking and action.

It is commonly agreed that a learning system is the composite of interwoven complexities among national and state governments and local school districts. A learning
system also includes learning strategies and goals set for all school levels and collaborative relationships in communities. In the most practical phase, through teaching approaches and actions in the daily classroom learning routine, teachers, as the main personnel in the educational service delivery process, may inevitably convey their philosophical beliefs and personal considerations of education to their students. Thus, teachers’ points of view regarding teaching and learning serve as important indices for the quality of knowledge conveyed in classroom settings and students’ and parents’ attitudes toward a given subject matter.

Along these lines, teachers of students with special needs are particularly critical of the entire educational system due to their significant role not only as educators, but as the mediators and advocates of the rights of students, parents, agencies, and the community. Thus, understanding that teachers’ beliefs and competencies can be influential in numerous respects, one may wonder how a specific area of learning – for instance, braille literacy – is recognized and presented by its most significant mediator, the teacher of students with visual impairments (i.e., the vision teacher). In this study, the investigator examines vision teachers’ educational background, instructional resources and support, and strategies and curriculum development for teaching braille to visually impaired students in Taiwan.

Statement of the Problems

Abraham Nemeth (1988), a totally blind mathematician who developed the braille code for mathematics and science notation in 1952 which was named after him, commended that braille
…liberated a whole class of people from a condition of illiteracy and dependency and has given them the means for self-fulfillment and enrichment…Braille makes it possible for a blind person to assume a role of equality in modern society, and it can unlock the potential within him to become a contributing member of his community on a par with his sighted fellows. (Nemeth, 1988, p. 316)

Rex, Koenig, Wormsley, and Baker (1985) pointed out that braille literacy as an integrated view of literacy not only encompasses the conventional notions of reading, writing, speaking, and listening, but also greatly develops these abilities to integrate meaningfully with life skills.

Numerous studies in the United States have paid attention to teachers’ voices and perspectives of teaching braille to visually impaired students (Amato, 2002; Corn & Koenig, 2002; Craig, Hamack, & DePriest, 1997; DeMario, Edwards & Lewis, 1998; DeMario & Lian, 2000; DeMario, Lang, & Lian, 1998; Koenig & Holbrook, 2000d; Ponchillia & Durant, 1995; Sharpe & McNeal; 1995; Wittenstein, 1993a, 1993b, 1994; Wittenstein & Pardee, 1996). In an effort to understand the research knowledge represented in different ways, more studies have recently been conducted in descriptive qualitative approaches to recognize teachers’ thoughts regarding braille and braille instruction (Craig, Harnack & DePriest, 1997; Wolffe, Sacks, Corn, Erin, Huebner, & Lewis, 2002).

In Taiwan, however, very little literature can be found in the research database about braille teaching issues, not to mention teachers’ perspectives of braille literacy and instruction. In fact, while the investigator searched the integrated research databases in Taiwan by the keywords of “visual impairments,” “education for students with visual impairments,” and “braille,” there were 194 commentary articles and research reports found between 1970 and 2006 that were written from educational perspectives rather than
medical or technical. However, only 20 of these were braille-related. The primary foci of these writings were student’s braille reading skills, braille literacy teaching and learning, braille-related technology products, and introduction of braille knowledge and information. Particularly in the last 10 years, researchers in Taiwan have been interested in the topics of visually impaired students’ adjustment in the inclusive classroom and computer technology implemented in braille literacy instruction. As for teachers’ competency in braille literacy, however, only one article (Lin, 2002b) published in the newsletter (啟明苑通訊, Newsletter of Chi-Ming Yuan) of the Department of Special Education at the National University of Tainan had reviewed the literature on braille literacy and suggested the need to study vision teacher education in Taiwan.

The deficiency of research on braille literacy in Taiwan may be the result of many factors, but not due to the insignificance of this topic. Individuals with visual impairments in Taiwan face a similar “Braille Literacy Crisis” as do their counterparts in the United States (Johnson, 1996; Lin, 2002b). To address the need for braille, Johnson (1996) claims:

If we were to propose that sighted children no longer needed to learn to read and write, that they could get all the information from radio, television, or tapes, the idea would be rejected immediately. Visually impaired children are no different in that respect. The ability to read and write is absolutely essential if we expect them to become self-supporting in their adult life. (p. 276)

As unique and practical as it may be, the braille system typically provides the primary access to functional literacy for individuals with severe visual impairments. In the last decade, information widely transmitted through internet technology made visually impaired students’ braille literacy skills more important than ever for advanced literacy performance. Lin (2002b) specifically indicated that implementing computer
technology in braille literacy instruction, transcription, and textbook publishing has become the future trend of teaching braille to students in Taiwan. Thus, the ability to access written information has become as essential for braille students as for their sighted peers, not only to meet the legislative mandate but also to achieve effective interpersonal relationships and communication in our high-tech world. In this sense, the way(s) that teachers of young children with visual impairments teach braille is becoming an increasingly urgent issue that requires further investigation.

**Purposes of the Study**

The present study is intended to discover what Taiwanese teachers of young and beginning braille students in different types of programs think regarding their braille training experiences and their braille literacy competency. Since the investigator is also interested in learning how young and beginning braille students’ literacy skills are nurtured in the early braille developmental stages, this study will explore teachers’ instructional strategies for developing emergent literacy, early braille literacy, and beginning formal literacy teaching programs for kindergarten through second grade in Taiwan.

This study will explore teachers’ competencies of and attitudes toward braille literacy related to their instructional approaches in classroom settings at the present time. It is hoped that the study will contribute to the body of literature regarding the development of early braille literacy skills in young visually impaired children in Taiwan.
Another anticipated goal is to provide suggestions to teacher training programs that prepare pre-service and in-service teachers to work with visually impaired students in Taiwan.

**Definition of Terms**

*Assistive Technology*

The term “assistive technology” refers to specialized equipment that enables students who are visually impaired to have access to the same kinds of information as their sighted peers. Generally, assistive technology involves a range of hardware and software for the visually impaired to obtain vast amounts of information through the following three approaches: enhancing visual images on the screen, causing the computer to speak, and providing information in braille (Kapperman & Sticken, 2000). The current study adopts the third approach to indicate the kind of assistance that assistive technology provides for braille users. (Hereafter, “technology” in the current study refers to assistive technology that enables individuals with visual impairments to obtain braille information.)

The commonly used assistive technology for students’ braille teaching and learning includes braille notetakers, computers with braille-translation software and braille printers, refreshable braille displays, alternative input devices (i.e., an electric brailler that can be hooked up to a computer), speech synthesizer and screen-reading software, scanners and optical character recognition software, and adaptive keyboards (D’Andrea & Barnicle, 1997b).
**Braille Literacy**

The term “braille literacy” refers to skills one possesses to read and write in braille, to comprehend meanings of texts, and to communicate with each other in a meaningful way. Braille literacy is divided into three levels by developmental perspectives: emergent literacy, basic/academic literacy, and functional literacy. Emergent literacy for visually impaired children requires the use of direct, repeated, and meaningful experiences with braille literacy materials and activities. Basic literacy includes all types of school tasks that involve braille reading and writing. A functionally literate individual can perform a wide range of literacy tasks required in daily life, understand his or her audience’s reading modes and make the proper modification for the audience, and use appropriate tools to communicate with others for obtaining print texts (Koenig, 1992).

**Dual Media**

Dual media in the study represents a literacy learning approach for students with low vision. Determined by the student’s educational team, both print and braille instructions are provided to the student in a parallel or nonparallel fashion. The student who reads in dual media should receive regular, consistent, and intense instruction in each medium during the early grades. Continuous assessment is required to examine the student’s efficiency of using each medium in literacy tasks (Koenig & Holbrook, 2000c).

**The Nemeth Code**

The Nemeth code is used to transcribe mathematics, sciences, and other technical materials into braille. The significant differences between the Nemeth code and standard
literary braille are its context-dependent rules and the use of lower-cell numerals rather than upper-cell ones (Rex et al., 1985; Dotless Braille, 2002; The Braille Authority of North America, 2007).

**Teacher Attitudes**

The term “teacher attitudes” refers to teachers’ affective aspect of human behavior or philosophical beliefs toward their professional practices. A teacher’s attitude determines the learning atmosphere, social interaction in the classroom and, thus, students’ schooling achievement. The attitude could be reflected in several seemingly unobjectionable ways, for example, displaying work, decorating the classroom with motivational posters, or assigning students special tasks to perform on a rotating basis. Teachers’ dress-up appearance also expresses their respect to and feelings about students (Coleman, 2001).

**Visual Impairment**

The term “visual impairment” refers to a vision limitation that includes all people with decreased vision in all ranges of severity. *Legal blindness*, *functional blindness*, and *low vision* are three important terms that are commonly used in the United States. For the first, a person with *legal blindness* must have a significantly reduced visual acuity that is no greater than 20/200 in the corrected better eye or a significantly reduced visual field no better than 20 degrees in the corrected better eye. For the second, *functional blindness*, or *educational blindness*, a student with or without usable vision can benefit from the instruction of braille reading and writing. The definition for *low vision* refers to the central visual acuity of 20/70 to 20/200 in the corrected better eye or a visual field of 20
to 40 degrees or less in the corrected better eye (Huebner, 2000). The definition of educational blindness provides more valuable information than legal blindness for placing a student in the educational setting (Corn & Koenig, 1996). This is also the definition that the current study applies for braille students, students with severely visual impairments, or students who are blind or visually impaired (or simply used as students with visual impairments in the current study).

In Taiwan, the educational definition for visual impairment indicates that the student’s visual acuity in the corrected better eye is no greater than 20/70 or the visual field in the corrected better eye is no greater than 20 degrees. For the individual with an unidentifiable visual condition, the alternatives should be applied to obtain the results of assessment for educational purposes (Wan, 2001).

Zhùyīn Braille

Zhùyīn Braille, used in Taiwan, is based on a phonetic representation of Chinese characters. The braille system includes 21 consonant symbols, 16 vowel symbols, 22 double-symbol symbols, and four tones (a fifth tone is used to achieve a special intonation by shortening one tone and pronouncing it slightly) to make 408 Chinese sounds (Wu, 1993). The phonetic symbols only indicate the pronunciations of individual Chinese characters but have no connection to the inkprint characters (Appendix A).
Research Questions

1. What are the educational backgrounds of the participants who teach braille literacy to young and beginning learners in Taiwan?

2. What are the differences and similarities in availability of instructional resources for teachers in different educational environments?

3. What are the approaches or techniques used by teachers to implement braille literacy practices?

4. What are teachers’ concerns about braille instruction?

5. What recommendations do in-service teachers of young visually impaired children suggest to enhance the braille literacy instruction curriculum in teacher preparation programs?
CHAPTER 2

LITERATURE REVIEW

This chapter first presents the investigator’s observations and reflections of using braille in the classroom, which led to the investigator’s desire to seek answers to her self-inquiries regarding braille and contribute to future research. Next, the chapter reviews the literature under the following four categories: legislation affecting education for students with visual impairment, literacy and blindness, braille literacy education in Taiwan, and braille instruction programming in Taiwan.

Previous Field Experiences

In the spring of 2005, the investigator volunteered to assist two U.S. teachers of students with visual impairments (vision teachers) in their literacy-related sessions in their classrooms. The five-month field research was conducted in order to obtain a clear view of the teachers’ literacy practices in their classrooms and their interactions with the school environment. The investigator found that the two teachers of the self-contained classes were knowledgeable in literacy theory and instructional strategies for both sighted and visually impaired children in K-2 classes. However, they differed in the way they planned their curriculum and arranged the material to be taught. The teachers’ knowledge of braille theory and teaching strategy may have impacted their confidence
in addressing students’ developmental problems, disability conditions, and learning difficulties, as well as impacting their ability to respond to the demands of educational agencies and legislation regarding literacy education.

Thus, the investigator wondered: How is a vision teacher educationally prepared to teach braille/pre-braille literacy? What attitudes does a vision teacher possess and what strategies does the teacher use to face the power of education agencies or legislative mandates on her literacy instruction practices? How would the situation appear in different educational service settings? How would teachers’ braille literacy instruction differ in different countries with differing educational policies? With these self inquiries, the investigator felt the need to understand, from the practitioners’ points of view, the big picture of braille instruction in Taiwan – the investigator’s home country – specifically, teachers’ professional training background in braille instruction, their current situations of braille instruction practice, and support they received for and concerns they have about their braille teaching practices.

Given that vision teachers rely heavily on support from state and local educational agencies in various respects, any educational regulation influences teachers’ classroom teaching. First of all, the following section provides a brief description of how education-related legislative decisions and actions influence the way that elementary and younger students with special needs, especially those with visual impairments, are taught.

**Legislation Affecting Education for Students with Visual Impairments**

Educational services that individuals receive are a result of policies made in response to social demands. In the United States, the current federal requirements in the
Individuals with Disabilities Education Improvement Act (IDEA 2004) and No Child Left Behind Act (NCLB) of 2001 have drawn attention to approaches to promote academic standards for teaching elementary and younger students, teachers’ qualifications, and funding for state and local schools.

In the field of serving students with disabilities, the Individuals with Disabilities Education Act (IDEA), or its later name, the Individuals with Disabilities Education Improvement Act IDEIA, has been one of the most influential legislations in special education. This primary federal program authorizes states and local districts to provide special education services for students with special needs. Paralleling NCLB, the IDEA 2004 has been amended as Public Law 108-446 with the following intent:

To assist children with disabilities achieve high standards – by promoting accountability for results, enhancing parental involvement, and utilizing proven practices and materials; and, by proving more flexibility and reducing paperwork burdens for teachers, States and local school districts. (Federal Register, pp. 35782-35783)

Summarized in CEC Today (2005), the 2004 amendments address significant concerns such as accountability for students with disabilities, teachers’ burden of paperwork, methods to assess students with learning disabilities, and teachers’ qualifications in classroom teaching. As Turnbull (2005) explained, IDEA 2004 is closely associated with NCLB and clearly indicates that local and state education agencies share responsibility for educating students with disabilities, while parents of students need to take more responsibility to be more actively engaged in their children’s education by communicating with local and state education agencies.

Of all the sections discussed in IDEA 2004, the “National Instructional Materials Accessibility Standard” (NIMAS) continues to call attention to the need for appropriate
instructional materials to be provided in a timely fashion to students with disabilities, especially students with visual impairments. Stryker, Huebner, and Hatlen (1999) argued earlier that obtaining educational materials in a timely manner enables students with visual impairments to access the same information as their sighted peers. According to the Federal Register (2006), the implementation of NIMAS requires the rights and responsibilities of state education agencies to ensure that specialized instructional materials in accessible formats are made available to children with disabilities, especially those with visual impairments, in a timely manner. The state education agencies also need to work collaboratively with the responsible programs to provide students the assistive technology, and assume responsibility in supporting local education agencies to purchase specialized instructional materials for students with special needs (Federal Register, 2006).

In summary, among a variety of issues concerning education for students with special needs, obtaining accessible reading materials in a timely matter for visually impaired students should take priority over all other topics at the current time. The development of NIMAS specifically for students with visual impairments also implies that obtaining accessible reading materials, especially textbooks, as a take-for-granted issue for sighted children, was never easy for a visually impaired student in the past. One cannot help but ask, just because a child is visually impaired, does it mean that reading and writing skills for him or her are less important than for sighted students?
Literacy and Blindness

In our technologically advanced world, the highly visual information reliance has impacted the development of social, cognitive, and linguistic structures. Literacy skills, thus, have become necessities to living more fully in the social, economic, and political realms of mainstream society (Dunlea, 1989; Paul, 2001). However, unlike sighted individuals who take seeing for granted, those whose vision is limited must intensively work on realizing the unique quality of the simultaneity of information that sighted people can obtain with ease.

As sighted people capture information and knowledge through print, the visually impaired individual uses braille to access information and communicates with others through braille literacy. Braille is not a language but a special code system with formulated rules and signs of configuration that can comprehensively represent the existing language in print. This code system is one in which each unit of character, or cell, is portrayed graphically by six embossed dots arranged by two vertical rows of three dots each. Sixty-three different combinations of braille configurations generated from the six dots are essential to the English literary braille system to cover the twenty-six letters of the braille alphabet, punctuation, numbers, composition signs, and one hundred and twenty-six contractions and short-form words (Hall & Newman, 1987; Rex, Koenig, Wormsley, & Baker, 1985). Other braille codes include the music braille, the mathematics and science braille (the Nemeth code), and the computer code. Generally different symbols used in languages other than English are represented by special braille symbols, accent marks, and letters specific to the particular languages (Rex et al., 1985). Zhùyīn braille is one example which will be discussed later in the current study.
Early Language Development of Children with Visual Impairments

Theoretically speaking, there may not be much difference between learning literacy in regular print or in braille because either mode requires developing skills of word identification and knowledge of the language of the script. However, braille users’ vision limitation has complications for their literacy learning processes and may require more effort in their mind’s activities to comprehend the world around them.

For the similarities of learning literacy through print and braille, Harley (1997) argued that, in essence, the processes of braille reading and print reading are the same in three regards. First, the goal of reading is basically to communicate. This makes no difference whether embossed dots, ink print, or any other form of writing is used. Second, learning literacy is a highly mental process that involves reading for meaning, searching and interpretation, not in the way that the information is demonstrated on the pages. The reader brings meanings and prior experiences to the page. Lastly, new information perceived from reading, through any medium, is one of engaging mental activities of reflection, generalization, and inferences, which aid the ambiguity and complexity of braille code system of its own.

From the perspective of perceptual development, Dunlea (1989) articulated that hearing may give clues about auditory information and sense of environmental distance. However, hearing is not the primary channel for the visually impaired to acquire meanings of objects, because audition lacks sufficient capability to convey concrete information about a new concept. Tactual and kinesthetic sensations, as two active learning agencies, actually enable the visually impaired individual to search for
information or sensory stimulation. Warren (1994) also indicated that visually impaired children create very few idiosyncratic words, and far fewer extensions of meaning are found in their vocabulary. Thus, he argued that the individual with visual impairments in fact forms new concepts in a sensory integration strategy. For early language development in visual impaired children, Dunlea (1989) also summarizes literature findings and indicates that visually impaired and sighted children are linguistically indistinguishable by 36 months; however, they demonstrate more differences of language development as they grow older. According to Dunlea (1989), children with visual impairments tend to have phonological and reference learning difficulties, and as they grow older, they tend to develop a “superficial” linguistic structure without full comprehension.

According to Warren (1994), the meaning of a word actually implies more than just the relationship of a word to its referent. Meaning represents “appropriate generalization and a network of semantic relationship to other words” (p. 145). For a child with visual impairment, the lack of simultaneous perceptions entails a limitation of tactual perception that has major complications in the student’s reading process in terms of lexical semantics, semantic relations, and pragmatics (Dunlea, 1989; Rex et al., 1985).

The above sections discussed visually impaired children’s language development from perspectives of sensory integration, phonological identification, and meaning comprehension. The following section furthers the developmental concerns for the braille reading process.
Characteristics of the Braille Reading Process

As the visually impaired child grows older, s/he needs to have well-developed skills with respect to language, as well as conceptual and tactual perception, so that s/he can utilize a complex braille reading schema to accomplish a more sophisticated reading task.

Wetzel and Knowlton (2000) indicated that the average braille reading rate is from 30% to 60% slower than the average print reading rate. Prior experience, phonological-awareness skills, tactual discrimination, and braille letter recognition are among the factors that are especially crucial to visually impaired young children’s future braille literacy abilities (Gillon & Young, 2002; Hall & Newman, 1987; Heller, 1985; Nolan & Kederis, 1969; Pring, 1982, 1985; Scholes & Willis, 1989; Wetzel & Knowlton, 2000; Wakefield, Homewood, & Taylor, 2006).

In Perceptual Factors in Braille Word Recognition, Nolan and Kederis (1969) tried to determine the basic perceptual factors that influence an individual’s braille word recognition process. Nolan and his colleagues indicated that earlier studies attempted to investigate correlations between IQ and reading achievement in young children with visual impairments. They agreed with the argument by Smith (1961) that “mental age actually is a more basic determinant of reading success when children have reached the stage at which they read to learn than it is when they are learning to read” (p. 87). Nolan and Kederis concluded that prior experience integrated with various perceptual experiences contribute to visually impaired children’s braille reading development. Prior experience has been further identified as having a high correlation with braille word
recognition and auditory or visual discrimination, language development, and breadth of
the individual’s experience (Gillon & Young, 2002; Heller, 1985; Pring, 1982, 1985;
Scholes & Willis, 1989).

From another perspective, Gillon and Young (2002) examined the relationships
among visual perception, phonological awareness, verbal cognition, and later reading
capacity. They found that spoken language development is particularly important in early
language development. The authors point out that sighted children’s phonological-
awareness skills are related to later literacy task processing skills:

The ability to identify sounds in words, understand phonological similarities
between words, and segment words into their individual sounds involve tasks that
tap phonological awareness. These skills, coupled with the ability to hold
phonological information in working memory and to gain access to phonological
information in an efficient manner, assist children to decode print. (Gillon &
Young, 2002, p. 39)

Consequently, braille learning is similar to regular print learning because braille is
also based on phonological principles. To further investigate the impact of visual
perception, phonological awareness, verbal cognition on later reading capacity, Gillon
and Young (2002) designed a study to examine the completion of phonological-
awareness tasks and reading measurements by 19 braille students in New Zealand. The
findings show a strong relationship between students’ phonological-awareness skills and
their braille reading accuracy and text comprehension. These students’ strengths and
weaknesses of phonological-awareness development can be predicted by the matched-age
sighted children’s development patterns. This finding supports the arguments by Pring
(1982) that, no matter what the input stimulation, whether it is visual or tactile, a level of phonological-awareness mediation appears between braille or print reading processes and determining the meaning of the word.

Wakefield, Homewood and Taylor (2006) argued that vision perception may be significant in visually impaired children’s verbal fluency performance. In order to understand whether there are differences between visually impaired and sighted students in verbal fluency tasks, Wakefield and her colleagues were particularly interested to discover whether early blindness is associated with the apparent compensatory changes in verbal fluency. They conducted their study with 16 visually impaired students and 18 sighted students completing four different verbal fluency tasks. The results indicated that children whose visual impairment developed before the first birthday outperformed the sighted students on the phonemic but not semantic fluency tasks.

The researchers concluded two possibilities for their finding. First, it may be that the visualization strategies the sighted students utilized to surpass the visually impaired students in semantic tasks were not concomitant with attending phonemic elements. Second, the visually impaired students switching their answers in the phonemic tasks more times than the sighted students might imply that the visually impaired students had more phonemic categories or identification approaches and therefore they may pay more attention to the onset phonemes. Even though Wakefield et al.’s (2006) study did not reveal a significant difference between the visually impaired and sighted students in semantic fluency tasks, the researchers argued that attentional load plays a crucial role in developing one’s verbal fluency.

Understanding that braille learning processes involve various factors, such as prior experience, phonological awareness, vision-related information mental processing, and efficiency of tactile discrimination, we must step back to ask two essential questions: Who is qualified for braille learning? and How is the particular reading method selected for a particular child?

_Determining the Reading Medium for Students with Visual Impairments_

Students who are visually impaired substantially rely on sensory efficiency to capture and learn information about their environment. The learning medium assessment is used to gather information of visually impaired students’ unique sensory needs. The assessment is intended to guide instructional planning

…to ensure that each student gains solid literacy skills in a conventional literacy medium or media (print and/or braille) and develops a wide repertoire of literacy tools to accomplish the daily demands of school, employment, and life. (Koenig, Holbrook, Corn, DePriest, Erin, & Presley, 2000, p. 117)

The reading medium assessment, usually associated with functional vision assessment, involves visual, tactile, and auditory learning media, as well as efficiency of using literacy media such as braille, regular print with low vision devices, and large print (Heller, D’Andrea, & Forney, 1998; Koenig et al., 2000). Koenig and Holbrook (1989)
proposed that the student’s reading medium should be determined by a multidisciplinary team as the basis of objective data collected from teachers, the student’s parents, and professionals concerned (Craig, Harnack, & DePriest, 1997; Koenig & Holbrook, 1989; Koenig et al., 2000). A two-phase process of diagnostic teaching evaluation is necessary to ensure that the medium selected increases the student’s learning efficiency in the initial- and continuous stages of medium application. The teacher of students with visual impairments in the multidisciplinary team plays a key role in the initial stage to collect data for the student’s vision efficiency and learning conditions (Koenig & Holbrook, 1989). These responsibilities that teachers assume could provide the most important information for the medium choice, especially as braille is made to be the primary medium (Wormsley, 1997).

Low Vision

Making decisions regarding students’ reading medium is especially critical for students who are visually impaired but not totally blind at the current time. Since students with severely low vision possibly had or will have different degrees of braille- and print reading experiences, their unique needs, problems, and abilities make the process of reading medium selection and instructional strategies much more complicated for them than for those with mild low vision or total blindness (D’Andrea, 1997a; Koenig & Holbrook, 1989; Koenig & Holbrook, 1992).

The education team determines the reading medium for the student after the initial and continuous assessments have been made. Some students with low vision may find themselves benefiting from reading print with specialized modifications (e.g., enlarged
print materials, using magnifiers or the closed circuit television), while others may find braille to be a more efficient way for reading and writing. However, if the educational team is not certain about the student’s appropriate reading medium after the assessment has been made, the team may decide how and when braille instruction should be provided along with regular print instruction in the early years, in case the student’s weak print-reading skills interfere with his/her school learning (Koenig & Holbrook, 2000c).

Usually, the parallel approach of the dual reading medium instruction, i.e., teaching braille and print concurrently and with the same level of intensity, is used with young students at the stage of beginning literacy development (Koenig, 1992). Since the criteria assure that the student has regular, consistent, and intense instruction in each medium in the primary grades, the vision teacher and the regular education teacher need to closely collaborate and coordinate their responsibilities to provide similar levels of instruction in each medium. With training in both media, the student can choose the most efficient and preferred medium in his/her higher grade levels (Koenig & Holbrook, 2000c).

*Deteriorating Vision Condition*

However, students with a deteriorating vision condition, who have never learned braille reading or learned it only as a secondary reading medium, are confronted with a special challenge when the educational team decides that braille should become the primary reading mode for them. In this case, the student’s degree of acceptance and adaptation of braille as a new reading approach is determined by various factors. These include psychological influences, tactual abilities, instructional approaches, and
individual characteristics (Erin & Sumranveth, 1995). Therefore, braille instruction to
those with deteriorating vision requires attention to individual interests, motivating
reading materials, regular practice, and frequent feedback at a highly individualized basis
(Erin & Sumranveth, 1995).

*Visual Impairments with Other Disabilities*

In addition, almost 60% of young children in the United States with severe visual
impairments have other disabilities, such as learning, physical and intellectual disability,
or deaf-blindness. Therefore, it is not uncommon that braille learning is recommended for
these visually impaired students with additional needs (D’Andrea, 1997). Koenig et al.
(2000) argued: “Regardless of the way they will use literacy in their lives, all students,
including those with additional disabilities, have the right to a comprehensive assessment
of their potential for and use of literacy skills” (Koenig et al., 2000, p.133). Planning the
educational program for visually impaired students with other disabilities is a challenge
for teachers because students may receive services from different service providers.
D’Andrea (1997) indicated that the transdisciplinary team approach has been proved
effective to assess and plan educational programs for visually impaired students with
other disabilities.

Since assessment and teaching are closely tied in this approach, the team
members need to share roles and skills with each other to help the student’s school
learning (D’Andrea, 1997). Thus, with some modifications, visually impaired students
with other disabilities, especially physical disabilities, may learn braille in the
conventional literacy programs. For those with visual impairments and cognitive
disabilities, the goal of learning braille is to use reading and writing to accomplish daily practical tasks (Heller, D’Andrea, & Forney, 1998; Koenig et al., 2000). The decision of which medium or combination of media is to be used depends on the student’s visual and other sensory efficiency, type and prognosis of the visual and disability conditions, effectiveness of the modifications to improve efficiency, and findings of the learning medium assessment itself (Heller, D’Andrea, & Forney, 1998).

Determining the reading medium for visually impaired students can sometimes be a challenging task that requires several assessments over a long period of time, with the expectation that the reading medium decided will help the student maximize his/her learning efficiency in academic reading and writing tasks. The following section moves to the classroom setting to understand current research on braille teaching and learning and instruction practices.

**Braille Literacy for Students with Visual Impairments**

In accordance with the focus of the study to explore the relationships between braille students’ particular learning needs and what and how teachers of visually impaired students can provide appropriate education services, it is necessary to understand the meaning of braille literacy and common braille instruction models. Next, the issue of braille literacy crisis is raised to address professionals’ concerns and research to act on promoting visually impaired students’ literacy in the last ten years.

*What is Braille Literacy?*

Braille literacy, in a sense, possesses similar elements as literacy in general; however, the nature of the users’ conditions and unique needs for the necessary skills for
Learning braille distinguishes braille literacy. In the current study, braille literacy refers to skills one possesses to read and write in braille, to comprehend meanings of texts, and to communicate with each other in a meaningful way. To understand a visually impaired individual’s literacy framework, Koenig (1992) reviewed a rich body of research and proposed emergent literacy, basic literacy, and functional literacy as three dimensions of literacy for the visually impaired.

Emergent literacy, from sighted people’s standpoint, refers to early interactions with written environmental symbols or language. This self-initiated and incidental learning experience, however, is unavailable for children with visual impairments to reach the same level as their sighted peers. Therefore, the emergent literacy of visually impaired children requires learning experiences to be established in a direct, repeated, and meaningful fashion with braille literacy materials and activities.

Basic literacy, or academic literacy, refers to all kinds of school tasks that involve braille reading and writing. Intensive and high-quality braille instruction is applied by well-trained teachers of visually impaired students (vision teachers) to ensure that adequate braille reading and writing skills are developed at the primary school ages. As a foundational skill for the young student, basic literacy requires consistent and continuous specialized instruction at least 1½ to 2 hours per day (Koenig, 1992).

Functional literacy, with regard to “the more practical and daily literacy tasks that permeate the lives of people in our society” (Rex et al., 1995, p. 12), is categorized by the individual who can perform a wide range of literacy tasks required in daily life. In addition, as a functionally literate braille user, the individual should be able to understand his or her audience’s reading modes and make the proper modification for the audience.
Lastly, one with functional literacy indicates that the visually impaired individual can independently use appropriate tools to obtain print texts to be able to communicate with sighted peers and teachers.

**Braille Instruction Models**

In the field of education for students with special needs, the discussion of literacy instruction typically addresses the use of direct instruction versus whole language. Proponents and opponents of both approaches continue to stand their ground with their different assertions. Gersten and Dimino (1993) examine the two approaches for students with disabilities and indicate that, even though whole language may motivate at-risk students to read on their own, the approach may not be as useful for students who cannot read. Therefore, reading instruction for students with special needs should consider engaging students in emergent literacy activities and reading comprehension activities, and providing well-sequenced and clear assistance in word analysis and oral reading. Both direct instruction approaches and whole language approaches have their merits from different perspectives, but some characteristics of both approaches also overlap with each other. Teachers should benefit from integrating them into their teaching of reading to at-risk students (Gersten & Dimino, 1993).

Rex et al.’s (1995) textbook, *Foundations of Braille Literacy*, which is used in teacher preparation programs for vision teachers, examined Goodman’s (1976) psycholinguistic models of reading instruction applied to braille instruction: the meaning-centered (top-down) model, skills-centered (bottom-up) model, and the interactive model. In their book, the authors identified that the application of instructive models greatly
depends on teachers’ philosophies of reading instruction, as well as on the access of braille learning materials. However, adding to that the nature of the braille code, the limitations of the tactual perceptual unit, and the practices of using the code, teachers typically apply skills-centered models to teach braille to their students. Thus, it is understandable why basal reading programs, based on the skills-centered model, have been recognized as the primary instructional approach to teach braille to young students in the early stages of learning braille.

Even though a majority of vision teachers use the skill-centered model, an increasing number of teachers and researchers found that visually impaired students, especially those in inclusion classrooms, benefit from both meaning-centered and interactive models of braille instruction (Day, McDonnell, & Heathfield, 2005; Koenig & Farrenkoph, 1997; Lamb, 1996; Swenson, 1988). This may be a result of the fact that more children with visual impairments are included in regular classrooms. However, Rex et al. (1995) also suggested that high-functioning children with well-developed pre-requisite braille skills can benefit from using the meaning-centered model, while low-functioning children can benefit from the skill-centered model which applies an intensive and attentive approach to developing basic braille reading skills.

There are factors other than the key role of teachers in selecting, implementing, and providing adequate materials for teaching braille, which cannot be ignored. One of these factors is the support of school districts that can make a significant difference in the choice of a teaching model and its successful use (Rex et al., 1995). In addition, the
availability of appropriate learning materials is also important. Finally, children’s degree of visual impairment contributes to the decision behind the selection and implementation of the braille teaching model, as well.

**Braille Literacy Crisis**

Numerous studies indicate a braille literacy crisis in the United States since the 1980s (Johnson, 1996; Mullen, 1990; Schroeder, 1989; Spungin, 1996). This decline may be due to teachers’ opinions and attitudes about braille that have been identified in numerous studies (Craig, Harnack, & DePriest, 1997; DeMario, 2000; Knowlton & Berger, 1999; Mullen, 1990; Wittenstein, 1993a; Wittenstein & Pardee, 1996). Schroeder (1989) proposed a line of consideration about the drop in braille usage.

As an individual with a visual impairment himself, Schroeder (1989) proposed the viewpoint of the National Federation of the Blind, that there is a discrepancy between the attitudes toward blindness of professionals and the visually impaired. Individuals with visual impairments believe that they can reach the same levels of achievement as sighted people if they can obtain substantial braille training and opportunities. Schroeder concluded: “What bars us from first-class status is not inferiority inherent in blindness, but rather the tacit acceptance of a diminished role with minimal expectations and minimal opportunity to form full participation” (Schroeder, 1989, p. 293).

Therefore, based on Schroeder’s (1989) conclusion, we can assume that a positive attitude of acceptance and belief in a visually impaired individual’s learning potential is important for gaining confidence in his/her competency and his/her own future. In turn, we can also assume that learning motivation of visually impaired individuals would lead
to demand for more training in braille literacy skills. Thus, if appropriate and timely braille instruction and devices, as well as sufficient training and opportunity, are made available to individuals with visual impairments, their mastery of braille literacy can become a reality.

Mullen (1990) also summarized the possible reasons that may have contributed to the decrease in braille literacy: (a) an undercount of visually impaired children; (b) emphasis on vision; (c) attitudes toward braille; (d) competency of teachers; (e) the nature of the braille code; (f) models of service delivery, and (g) the Individual Education Plan process. Spungin (1996) pointed out that the weaknesses in the census may result in errors to determine the number of functionally blind individuals who are potential braille readers. In spite of the explanation of statistical sampling inaccuracies, she attributed the braille decline to the deficiency of braille teaching standards and the effects of technological advances. She then reiterated that visually impaired students who are placed in the inclusive classrooms may be less motivated to learn braille (Spungin, 1996).

Teacher Attitudes

Among various factors that may bring about the decline of braille literacy, teachers’ attitudes toward students’ individual characteristics and the learning subjects may have a strong impact on their educational expectations for their students. This section first describes the significance of general education teachers’ attitudes toward students with particular characteristics, especially those with visual impairments. The section also summarizes the attitudes and opinions of general education teachers, special education teachers, and school administrators about including students with disabilities in
regular classrooms. Next, the section focuses on vision teachers’ attitudes about braille instruction. It also covers research literature that reflects different concerns of braille instruction. The literature review on Wittenstein’s (1994) project is particularly important as one key reference for the current study.

**General Education Teachers’ Attitudes toward Students with Particular Characteristics**

In general education, Colemen (2001) addressed the impact of teachers’ attitudes toward students. For example, if a minority student or one with a disciplinary problem is to be placed in a new classroom, teachers’ attitudes and behaviors may be different toward that student. These attitudes and behaviors may include being less tolerant and patient toward the student, having stereotypical expectations of the student, seating the student in a particular location of the classroom, or misinterpreting the student’s certain behaviors or actions. As a result, good or bad, the student may live up to his/her labeled reputation because s/he feels that is what’s expected of him/her (Colemen, 2001). The self-fulfilling prophecy, Colemen indicates, unfortunately determines the ceiling for students’ learning:

The nature of the dynamic of social interaction in the classroom is driven by the attitude of the teacher. Teachers set the tone for what transpires in the classroom. If teachers lack enthusiasm, students will be equally unenthusiastic. If teachers are sarcastic, students will respond in kind. In general, teachers who are enthusiastic about teaching, personable, and caring will, by their example, encourage the same traits in their students. Teachers with positive attitudes make a concerted effort to create a positive learning environment for their students. (Colemen, 2001, p. 94)

Tournaki and Podell (2005) designed a study to examine how the interaction between student and teacher characteristics affects teachers’ predictions of students’ academic and social success. They asked 384 general education teachers to respond to a
scenario about a boy or a girl, his or her reading achievement, social behavior, and attentiveness. The participants also answered questions in a teacher-efficacy scale. The results showed that teachers’ predictions of students’ achievement were in accordance with students’ characteristics and with their own sense of efficacy of teaching in general or of themselves as teachers. Teachers with high beliefs in their ability to affect student outcomes (high-teaching efficacy) presented flexible academic predictions toward students with diverse characteristics. Low teaching-efficacy teachers, however, tended to predict poorer academic outcomes of students who displayed characteristics that might impede teaching and learning. Therefore, Tournaki and Podell (2005) concluded that teachers with high-efficacy beliefs are of positive influence to students because they are more aware of, (or, at least, are less negatively influenced by,) the complexity of students’ individual characteristics.

In spite of the significance of teachers’ attitudes influencing students’ academic success, the investigation of general education teachers’ attitudes toward students with visual impairments is rarely found in the body of literature. The only research on this issue, by Wall (2002), is specifically concerned with teachers’ experiences with visually impaired students, and their attitudes toward including visually impaired students in regular classrooms. Wall sent surveys to inquire about general education teachers’ attitudes toward the most appropriate placement for visually impaired students, their willingness to make modifications, concerns about visually impaired students, and their perception of their own attitudes toward the placement and inclusion of visually impaired students. His findings showed that teachers who had direct or indirect experiences with students with blindness or visual impairments had more positive attitudes toward
inclusion, but only for students with low vision. Generally, teachers had negative attitudes about including visually impaired students in regular classrooms, and their positive experiences were noted when they were under less or no pressure in their work load. Teachers’ attitudes also largely relied on the setting, the moods of people involved, the comfort level of interaction, and the degree of fear that the teachers felt (Wall, 2002).

Wall’s (2002) findings parallels other studies’ findings about the attitudes of general and special education teachers and administrators toward the inclusion of students with disabilities in general education settings (Idol, 2006; Smith & Leonard, 2005; Villa, Thousand, Meyers, & Nevin, 1996). A satisfactory inclusive classroom perceived by general education teachers is one in which special education services (accompanying special education teachers, instructional assistants, or the resource classroom) can be provided efficiently for students’ academic needs (Idol, 2006). Although the division of labor between general education teachers and special education teachers is still a debatable issue, the importance of collaboration between professionals can never be overemphasized (Smith & Leonard, 2005; Villa, Thousand, Meyers, & Nevin, 1996). In addition, the principal’s role in an inclusive general education school should go beyond supporting a collaborative environment to being cognizant of personnel and resources needed to meet students’ needs (Smith & Leonard, 2005).

Vision Teachers’ Attitudes toward Braille Literacy

In terms of braille instruction for students with visual impairments, the attitudes of vision teachers can greatly influence the outcome of a student’s literacy competency. As Schroeder (1989) explained, if the attitude of the braille teacher is negative or biased
in certain ways, such as a low expectation of a student’s learning competency in certain academic areas, then the teacher may falsely reinforce students’ inferior braille performance, or worst of all, shy away from issues of blindness and braille instruction.

The increasing number of illiterate people who are potential braille readers may indicate the need to place greater expectations on teacher preparation programs at the university level (Schroeder, 1989). Thus, in accordance with the recent national education reforms of Goals 2000 (P.L. 103-227, 1994), No Child Left Behind 2001, and IDEA 2004, as well as the National Agenda for the Education of Children and Youths with Visual Impairments, Including Those with Multiple Disabilities (1995), the academic institutions for programming teacher education for students with visual impairments should ensure pre-service teacher’s positive attitudes toward and competency in braille literacy and instruction.

Current research on teachers’ attitudes and perspectives about braille instruction includes the following: (a) various aspects of reading medium selection (Craig, Harnack, & DePriest, 1997; Lusk & Corn, 2006a, 2006b); (b) personnel training/pre-service curriculum (Amato, 2002; Knowlton & Berger, 1999; Wittenstein, 1993a, 1994; Wittenstein & Pardee, 1996); (c) the Nemeth code (DeMario, Lang, & Lian, 1998; DeMario & Lian, 2000; Rosenblum & Amato, 2004); and (d) beginning/primary braille reading instruction (Caton, 1979; Day, McDonnell, & Heathfield, 2005). This study focuses on the last category, specifically, teachers’ attitudes or perspectives about braille instruction from emergent or beginning literacy.

To understand further the field of teaching braille literacy, during 1991-1992, Wittenstein (1993b) conducted a national survey with in-service teachers of visually
impaired students. The purpose of his survey, which was primarily made up of Likert-scale items, was to examine teachers’ attitudes towards the teaching of braille or towards their feelings of competence in their knowledge of braille. The survey also tapped teachers’ attitudes toward the recurrent controversial issues debated in contemporary braille literacy, as well as collected comments and suggestions from teachers in terms of braille training experiences. Almost fifty percent (49.9%) of his sample of 1,663 teachers of visually impaired students returned completed questionnaires.

Wittenstein’s (1993b) findings showed that the majority of the teachers were contented with their braille competency, excepting the knowledge of the Nemeth code. The respondents also recognized the importance of braille and strongly supported the use of braille. They agreed that studying both literacy skills and braille reading methodology is important to prepare teachers who can teach braille well to students with severe visual impairments. However, the majority of teachers also indicated that they received very little or no braille instruction methodology in their pre-service programs. The teachers whose pre-service training programs stressed more braille instruction methodology were more likely to feel competent in their own braille skills and in their braille instruction abilities. Teachers also expressed their sense that braille refresher courses were urgently needed to improve in-service staff development. Generally, teachers agreed that the Individualized Education Program (IEP) committees should retain their decision making power regarding students’ braille learning medium. The three most likely causes of the decline of braille literacy include the increase in students with multiple disabilities, reliance on technology, and itinerant model/large caseloads.
Another perspective of Wittenstein’s (1993b) findings is that, of all the respondents, 1,086 teachers provided substantial written comments to the survey questions ranging from one or two words to several hundred words that were compiled in 604 pages of texts, including drawings, students’ work, and photographs. Not expecting to receive so many rich comments, Wittenstein analyzed the descriptive responses to his questions and reported his summary in a paper published in 1996. He pointed out that the high response rate of the survey and the participants’ enthusiastic involvement in answering the questions reflect the teachers’ deep concerns about their students’ braille skills and the contemporary pre-service program development (Wittenstein, 1996). Likewise, the investigator in the current study also interprets the survey responses to Wittenstein’s study as the need to examine students’ braille skills acquisition and pre-service program development for teachers.

*Braille Instruction in the Core Curriculum for Students with Visual Impairments*

With the collaboration of professionals, parents, and service providers, the National Agenda for the Education of Children and Youths with Visual Impairments, including those with Multiple Disabilities (1995) was developed to form priorities for improving educational programming for children with visual impairments. Among the ten critical goals of the National Agenda, Goal 8 (*All educational goals and instruction will address the academic and expanded core curricula based on the assessed needs of each student with visual impairments*) specifies the Expanded Core Curriculum for Students with Visual Impairments. Hatlen (1996) identified braille communication skills as one compensatory academic skill in the Expanded Core Curriculum that visually
impaired students should access to learn as their sighted peers. It is also a functional skill that provides visually impaired individuals the opportunity to work, play, socialize, and take care of personal needs to the highest level possible (Hatlen, 1996).

In order to answer Hatlen’s call for the “professionally prepared teacher of visually impaired students [to] be responsible for assessment, instruction, and evaluation in unique and specialized curricular areas” (Hatlen, 1996, p. 31), and to ensure that braille instruction received by students is of high quality, Koenig and Holbrook (2000c) designed a 3-round survey study to gather professionals’ consensus on the levels of braille instruction needed. The goal of their study was to help students receive appropriate levels of instructional support and services to ensure their progress in braille literacy programs. The researchers obtained consensus from 40 professionals in the field to determine the levels of instructional services needed in braille teaching practices. In the end, they summarized 12 learning areas regarding different braille literacy skills: Emergent braille literacy skills, Early formal literacy skills (“prebraille”); Beginning braille literacy skills; Beginning braille literacy skills in dual media (print and braille); Intermediate braille literacy skills; Advanced braille literacy skills; Braille literacy skills for students with print literacy skills; Listening, aural-reading, and live-reader skills; Technology skills; Keyboarding and word-processing skills; Slate-and-stylus skills; and the Signature-writing skills (Koenig and Holbrook, 2000c).

Another study is also designed to investigate whether teachers’ practical teaching tasks help students with visual impairments to become confident, independent, and employable young adults. Related to Hatlen’s (1996) call for the adoption of the Expanded Core Curriculum for Students with Visual Impairments outlined in the
National Agenda, Wolffe and her colleagues (2002) conducted a qualitative study to observe actual classroom practices of 18 teachers with students with visual impairments in six states over a 6-month period. Their results showed that the teachers spent the majority of their instructional time on academics, teaching communication skills, and tutoring. Specifically, they took 18% of the total observation time to promote their students’ communication skills in teaching keyboarding and the use of adaptive software on computers, electronic note-taking devices, reading machines and scanners, braille reading and writing, the Nemeth braille code, and recognition of large-print icons (Wolffe, Sacks, Corn, Erin, Huebner, & Lewis, 2002).

**Braille Literacy Education in Taiwan**

*Legislation Affecting Literacy Education*

The Ministry of Education in Taiwan has recognized the importance of literacy as a basic learning capability and skills to enhance educational quality at both elementary and junior high school levels. In the 5-year Educational Reform Action Program, a nationwide educational movement launched in 1998, literacy proficiency was highlighted for the information era of the new century. Students who demonstrate competent performance in literacy can fulfill the goal of The General Guidelines of Grade 1-9 Curriculum of Elementary and Junior High School Education in “[e]xpression, communication, and sharing” (The Ministry of Education, Taiwan, 2000, p. 5). Therefore, students are expected to “efficiently utilize various symbols [such as language, writing, voice/sound, motion, graph or art materials] to express their thoughts, concepts, and feelings; thus, through listening and communication, [they] can share knowledge and
opinions and exchange different information with others” (The Ministry of Education, Taiwan, 2000, p. 5). After the initial term of the reform movement ended in 2003, the conclusions arrived at by the professional committee indicated that the significant achievements include establishing and amending many legislative regulations, improving school teaching and learning environment, learning with no boundaries through a technological networking, increasing the number of professional development programs for in-service teachers, and providing thoughtful and comprehensive school counseling services for students.

Follow-up educational policies and activities have continued since the completion of the first stage of the education reform. Among the new educational policies made since 2003, the most influential act for elementary students’ literacy education is multicultural education made explicit in The General Guidelines of Grade 1-9 Curriculum of Elementary and Junior High School Education. According to the Guidelines, all students in their third- to sixth-grade levels need to take courses in their mother tongue (e.g., Holo, Hakka, or aboriginal languages). In addition, English is listed as one of the main subjects in the fifth grade courses so that students will be well prepared as future global citizens. However, both parents and teachers alike have been outraged at the mandate to add a student’s mother tongue and the English language to the required course load. Some of the controversial inquiries they have raised include: What is the appropriate grade level for different language instruction? How do teacher preparation programs manage to train teachers for children who speak more than one language? How will the goal of decreasing a student’s academic burden or load be balanced against the mandate for students to learn two languages?
As controversial as it is, the core rationales of the new education policies coincide with the fundamental principles of teaching students with special needs by promoting integrity, flexibility, and functionality in curriculum and instruction development. Through a process of deliberate curriculum adaptations, the implementation of the new policies should not have much conflict with the educational services for most students with special needs (Chang, 2002; Wang, 2002). As such, students with visual impairments, especially those in the regular education system, will be expected to develop self expression skills, effective communication skills, and the ability to share information with others (The Ministry of Education, 2000).

Unfortunately, ever since the launch of the 5-year Education Reform Act Plan in 1998, little research has been focused on the influences of new policies on visually impaired students’ literacy learning; in fact, literature was rarely found to discuss what or how the new mandate affects literacy education for students with disabilities, despite the ceaseless debates with regard to general education.

**Research on Teachers’ Braille Instruction in Taiwan**

Educational policy makers for students with special needs in Taiwan have tended to view the developmental patterns in the United States as their leading model. When proposing educational programs, they have relied on related policies in the U.S. as references. Additionally, as mentioned earlier, as legislative regulations are enacted for visually impaired students in Taiwan, they may pose new challenges. If it is true that new educational policies and regulations will affect the academic focus in the classroom and scholars’ research orientation, then researchers of braille literacy education should
explore the meanings and positions of the new policies, in a similar way to the American researchers’ deliberations on the National Agenda to improve the quality of education for students with visual impairments.

However, since the 1970s, according to the results of a key word search in the integrated research database on the website of the National Institute of Educational Resources and Research, literature on braille instruction has been scarce in Taiwan (The National Institute of Educational Resources and Research, 2007). There are only six research reports and 14 general commentary articles related to the key work of braille in education perspectives, and only two out of 20 articles have been published in the three primary professional journals (Bulletin of Special Education, Journal of Special Education, and Bulletin of Special Education and Rehabilitation) in Taiwan. Topics of the 20 articles include braille reading methods (Chang, 1988; Chen, 2004; Chi, 1988a; 1988b; 1997; Chi & Yu, 1989), braille teaching and learning (Cheng, 2004; Chuang, 2001; Hsu, 2004; 2005; Lin, 2002b; Lin, Wang, & Pan, 1998), technology implementation in braille instruction (Cheng, Wang, & Pan, 1998; Chi, 1990; Huang, 2005), and introduction to braille knowledge and information (Chang, 2003; Chiang, 2004; Wang, 1991; Wei, 2001).

Among the scarce literature on braille instruction, two articles specifically indicate braille competency of vision teachers and students with visual impairments. Chuang’s (2001) article “Learning from the U.S. Braille Bill to Improve Students’ Braille Literacy Competency in Taiwan” discusses how the braille bill in the United States influences braille instruction for students with visual impairments. Lin’s (2002b) review
article titled “Issues on braille literacy competency for teachers of students with visual impairments” concerns braille instruction from teachers’ competency perspectives, which is specifically relevant to the present study.

Chen (2006) conducted a content analysis study of 86 research reports on the production of academic articles for individuals with visual impairments in Taiwan from 1998 to 2005. She concluded that the two highest foci among 11 research categories were investigations about visually impaired individuals’ physical and psychological conditions and assistive technology invention for individuals with visual impairments. She commented that the low percentages in studies of teacher education (8%) and curriculum and instruction development (5%) should call attention to professionals and educators in the field of visual impairments. In fact, Tasi’s (2003) master’s thesis, “Action Research of Chinese Braille Instruction,” is the only research project that has been completed to understand braille instruction in the classroom setting. As for empirical research about teachers’ attitudes toward and competency of braille literacy, which is the focus of the current study, there are unfortunately no studies to date in Taiwan’s research base.

**Braille Instruction Programming in Taiwan**

**The Zhùyīn Braille**

Zhùyīn braille is one of the braille systems exclusively used in Taiwan to represent the formation of Chinese characters. Based on phonetic representation of sounds of Chinese language Zhùyīn (in IPA as [tʂu̯ in˥˥]), the national standard system in Taiwan to transcribe Chinese is the abbreviation of Zhùyīn fūhào [tʂu̯ in˥˥ fu˧˥ h ao˩˩] as the “sound-annotating transcription system.” The system includes 21 consonants, 16
vowels, and four tones (a fifth tone is used to achieve a special intonation by shortening one tone and pronouncing it slightly) to make 408 Chinese sounds (Wu, 1993). The phonetic symbols only indicate the pronunciations of individual Chinese characters but have no connection to the inkprint characters. The first-grade textbooks of all subjects, including the Chinese language, were all written in Zhùyīn only, accompanied by Chinese characters in the next year.

As for Zhùyīn braille in practice, each Zhùyīn braille phonetic symbol is represented by a six-dot cell, and each Chinese character consists of a combination of braille phonetic elements: a consonant symbol, a vowel symbol, and a tone symbol (Appendix A – Example 1). In her article regarding the analysis of the structures of Zhùyīn braille, Wu (1993) notes,

The present Chinese braille system is a sound-generated system in that it assigns a six-dot braille cell to each of the phonetic symbols and conveys only the pronunciation of each character. Because the system is built on the phonetic part of the language and is not related to the character structure, it is difficult to teach the meanings of individual characters to visually impaired students. (Wu, 1993, p. 290).

Wu (1993) indicated two limitations of learning Zhùyīn braille because of the nature of Chinese characters: homophones and a character with multiple-pronunciations. For the first, Wu pointed out that the difficulty is because some Chinese characters have identical pronunciations with entirely different meanings. Teaching one meaning to visually impaired students is not sufficient because the student must learn to differentiate a character’s meaning when it is used with other characters in the text (Appendix A – Example 2 and 3). Another difficulty Wu raised is that some Chinese characters have more than one pronunciation with different meanings. The major difficulty with this
respect is that the student would not make the right connection between a Chinese character and its corresponding pronunciation. Furthermore, the student would have a problem conveying the different meanings associated with a common character (Appendix A – Example 2, italics and un-italics).

*Education Services for Students with Visual Impairments in Taiwan*

In the United States, education for students with special needs involves a continuum of services to ensure good quality and appropriate education arrangements to meet each student’s particular needs. The type of education service that a student receives must be based on the Least Restrictive Environment (LRE) requirement of IDEA that:

> To the maximum extent appropriate, children with disabilities, including children in public or private institutions or other care facilities, will be educated with children who are not disabled, and that special classes, separate schooling or other removal of children with disabilities from the regular educational environment may occur only when the nature of severity of the disability is such that education in regular classes with the use of supplementary aids and services cannot be achieved satisfactorily. (20 U.S.C. § 1412[a][5])

Thus, the state and local agencies should ensure that different intensive educational services are available in both regular public school environments and specialized placements for the varying needs of students. The educational service a student receives is decided by the IEP team that ensures that the environment(s) meets the student’s goals and objectives. In the field of education for visually impaired students, however, what LRE calls “to the maximum extent appropriate” requires specific elaboration regarding its intentions and ways of practicing it (Lewis & Allman, 2000).

Even though the majority of visually impaired students is positioned in general education settings with specialized services for the visually impaired, the criteria of LRE
for others, especially for those with complex educational needs, may require being placed in separate educational institutions. According to Lewis and Allman (2000), there are four common types of educational placements or service models for visually impaired students in the United States: the consultant model, itinerant services, resource room model, and settings designed specifically for students with visual impairments. Likewise, three types of placements or services are currently practiced in Taiwan: itinerant teaching/consultant programs, resource room services, and special/residential schools for the visually impaired (Lin, 2001; Wan, 2001). Below, a brief introduction of education for students with visual impairments in Taiwan will be addressed.

In Taiwan, special education was initiated by Tainan School for the Blind and Mute in 1915. However, education for those with special needs did not attain its legal status until 1968 when the Regulation for a Nine-Year Compulsory Education went into effect. In 1984, Taiwan passed The Act of Special Education which was the first legal policy in Taiwan that focused on teaching students with special needs. In 1997, the Physically and Mentally Disabled Citizens Protection Act was passed to protect the education right of disabled individuals. In Article 21 of Chapter 3 it states,

The competent authorities of individual levels in charge of education shall actively help the disabled to receive schooling, and the schools of individual levels may not refuse the disabled because of the class or degree of disability, or because of the fact that the special education class (school) has not been established. (The Ministry of the Interior, 2004)

Shortly after this Act, the amendment of The Act of Special Education 1997 required that every student with a special need must be placed in a developmentally appropriate classroom based on the principle of the least restrictive environment. Each county, which is similar to a school district in the United States, should provide special
education services to students who are identified as in need of special services, and their academic learning should be based on their Individualized Education Program (IEP). In addition, this amendment also initiated the requirement that special education should be extended to the age of 3, and young children with special needs should be included in the committee system for determining the best early intervention services they need (The Ministry of Education, 2004). Currently, local educational agencies, following the criterion of the “cascade of placement” to provide a variety of educational settings in all educational levels (Appendix B), ensure that students with special needs in both regular- and residential schools are appropriately served to meet their unique needs (The Ministry of Education, 2007).

To develop a solid foundation of educational services to students with disabilities, the Taiwanese government took two censuses for children with disabilities: the first one was during 1974 and 1976, and the second was during 1990 and 1992. The results of the recent census show that out of those between ages six and 15 (the age range for compulsory education) in Taiwan, there are 75,562 children with special needs. Among them, 1,931 students (2.56% of all special needs students or .054% of the whole student population) were visually impaired (The Ministry of Education, 2007). In the most recent Special Education Annual Statistics Report of 2006, there were 59,252 students with disabilities between the ages of six and 15. Of these, 1,119 (1.89%) were visually impaired. The total number of 1,699 students in kindergarten through senior high school was visually impaired. These students obtained educational services from 256 certified vision teachers in 2006-2007 (The Ministry of Education, 2007).
According to D’Andrea (1997), certified teachers of students with visual impairments are:

…the specialists who know how to teach braille reading, writing, and mathematics, as well as other disability-specific skills. They play a crucial role in deciding when certain skills should be taught and in what sequence, assessing the skills, determining the maintenance and application of skills, developing Individualized Educational Plans (IEPs), and so forth. (pp. 147-148)

Currently, a certified vision teacher in Taiwan means a college graduate who completed a series of vision courses in the department of special education or one who finished the post-bachelor teacher preparation program for teaching students with visual impairments. The teacher preparation program is provided by the Center of Education and Rehabilitation for the Visually Impaired which is affiliated with the Department of Special Education in the National University of Tainan (hereafter as NUTN) (Lin, 2002a). Every year, the Center of Education and Rehabilitation for the Visually Impaired, as the central administrative and training center for vision teachers, is responsible for collecting final reports of educational services from each city and county bureau of education in Taiwan. Lin (2002a), the former director of the Center of Education and Rehabilitation for the Visually Impaired, conducted a content analysis of the annual reports about education for visually impaired students in mainstreamed settings. The results show that, in all 23 cities and counties, over 70% of vision teachers serving in the regular education settings were certified vision teachers. In fact, almost 60% of vision teachers in both mainstreamed and specialized schools obtained their initial teacher preparation training from the post-bachelor teacher preparation program in NUTN (Chen, 2005; Lin, 2002a).
The following sections introduce the characteristics and practices of the three types of educational services for students with visual impairments in Taiwan: itinerant teaching/consultant program, resource classroom and special/residential school.

**Itinerant Teaching/Consultant Program**

The itinerant teaching/consultant model is an education delivery approach in which specially trained teachers who are employed by the school district, a nearby residential school, or a regional, state, or provincial education agency travel around the neighborhood to provide direct teaching or consultation services for students with special needs (Olmstead, 2005). In the field of education for students with visual impairments, the itinerant teacher’s role in general is to work on vision-related or disability-specific skills, that is, skills related to the Expanded Core Curriculum. The two primary responsibilities of an itinerant vision teacher are to teach literary braille and mathematical and scientific braille to the braille reading students and to determine the appropriate accommodations for visually impaired students (Olmstead, 2005). Itinerant teachers who provide minimal or no direct services to visually impaired students use the transdisciplinary approach to programming students’ learning objectives with associated personnel, and they provide consultation services to students’ primary teachers in general classes on a regular basis (Lewis & Allman, 2000).

In Taiwan, among several itinerant educational programs for students with different disability categories, vision itinerant services was first developed in 1967 (The Ministry of Education, 2007), incorporating the comprehensive and organized teacher preparation programs in NUTN in 1966. The Center of Education and Rehabilitation for
the Visually Impaired in NUTN closely collaborates with the vision specialist administrators (all trained in the vision teacher preparation program in NUTN) in each city/county department of special education to ensure that they properly convey the information and needs to each other (Lin, 2002a).

It is necessary to practice itinerant educational services in Taiwan for similar reasons as in the United States, such as the visually impaired student number is too limited to establish a resource classroom or a self-contained classroom (Lewis & Allman, 2000; Lin, 2001). The findings of Chang’s (2004) nationwide survey with itinerant vision teachers of students in elementary schools and junior high schools support the need for vision itinerant programs in Taiwan. At the time of his survey, about 50% of visually impaired students were served under the itinerant programs, followed by non-categorical resource classrooms and self-contained classrooms (Chang, 2004). In spite of that, itinerant teachers in Taiwan face the same challenges as those in the U.S. on issues of itinerant teachers’ roles and responsibilities, transportation, caseload, and communication (or conflicts) with regular classroom teachers and administrators (Lin, 2001).

Resource Classroom

Resource classrooms are a widespread means of service delivery for students with mild disabilities. In public schools, a student receives education services from a special education teacher in a resource room in part of his school days. Once the student meets his specific academic goals, he may return to his full-time regular classroom without any support services. Teachers of resource rooms are trained to provide general academic assistance for students with special needs in regular schools (Olmstead, 2005). However,
the indefinite boundary between providing help to students’ instructional needs related to visual impairment and providing academic tutorial remains debatable. In reality, in order to ensure the student’s comprehension in academic courses, the teacher engages a substantial amount of time to teach reading or basic mathematics concepts to the student to develop a solid foundation for future learning (Lewis & Allman, 2000).

In Taiwan, vision teachers provide educational services to students in two types of resource classrooms: single-category resource room and cross-category resource room. The former type of service, only provided in Taipei City, delivers vision-specific assistance to students who are primarily positioned in the regular classes in the elementary schools or junior high schools. The type of service is suitable to implement in the metropolitan area for a group of visually impaired students with an approximate age range and similar visual functions (Lin, 2001; Wang, 2003). The vision teachers serving in the cross-category resource rooms are certified in general special education with an additional certification of teaching visually impaired students. These teachers provide both basic services to students with mild disabilities of all categories and specialized services to visually impaired students in the same classrooms (Conversation with Teacher Q, 04/16/2006).

Residential or Special Day School

Residential or special day schools provide education services to students who would benefit from full specialized services in specially designed educational settings. Initially, schools for the blind in the United States provided both academic and nonacademic programs to visually impaired students without other disabilities. Ever since
the 1960s, the student population in all schools for the blind became diverse with a
dropping number of students with visual impairments only and an increasing number of
visually impaired students with additional disabilities. Thus, schools for the visually
impaired experienced a structural transition from being “academically proficient-
oriented” to “functional- and developmental-oriented” (Hatlen, 2000; Lewis & Allman,
2000). Today, schools for the visually impaired in the U.S. play a new role in providing
consultant services for students’ parents, regular school administrators, and the public, as
well as resource centers for vision teachers’ services in regular school systems (DeMott,
1993; Hatlen, 2000; Heward, 2006).

Among the 23 special schools for students with disabilities in Taiwan, three are
special schools for the visually impaired. Since education for visually impaired students
in Taiwan is greatly influenced by the service development in the United States, schools
for the visually impaired also encountered the impact of inclusion in the last three
decades and continued to define their new positions in the field (Lin, 2001). The reduced
total student population and the increased number of visually impaired students with
multiple disabilities in the special schools became a crucial challenge to vision teachers’
professional knowledge and instructional quality in their teaching career (Chi, 2005).

1,699 students with visual impairments from kindergarten to senior high school grade
levels received specialized educational services in Taiwan. Of these, 416 were placed in
the three special schools for the visually impaired: 146 attended the private Huei-Ming
School for the Visually Impaired, which typically accepts visually impaired students with profound multiple disabilities, and 270 attended the two public schools for the visually impaired.

**Summary of the Literature Review**

The idea of the current study was derived from the investigator’s classroom observation in the United States. Her field experience, reflections, and self-inquiries of observing the two distinct types of teaching practices motivated her efforts on the current study. The topics of the reviewed literature, which emerged from her observations, helped her develop the theoretical foundation of the study. Research to date was reviewed in the following areas: (a) legislation affecting education for students with visual impairments, (b) literacy and blindness, (c) braille literacy for students with visual impairments, (d) braille literacy education in Taiwan, and (e) braille instruction programming in Taiwan. Each of these areas examines braille instruction from different perspectives, those of legislators, teachers, students with visual impairments, as well as researchers. Growing attention to braille instruction has led to training programs for vision teachers in an effort to improve the performance of students with visual impairments. Particularly two of these studies, Wittenstein’s (1993b) and Koenig and Holbrook (2000c), directly inspired the current study.

Much research has been conducted in the United States on legislative influence on literacy education for general students in the grade levels as well as on students with special needs, or specifically, students with visual impairments. Research in the U.S. has also focused on the development of braille literacy skills for students with visual impairments.
impairments and on the criteria and procedures that vision-related professionals follow to
prescribe braille instruction to students with various types of visual impairments.
Numerous studies in the U.S. have paid attention to teachers’ voices and perspectives of
teaching braille to students with visual impairments (Amato, 2002; Corn & Koenig, 2002;
Craig, Hamack, & DePriest, 1997; Edwards & Lewis, 1998; DeMario, Lang, & Lian,
1998; DeMario & Lian, 2000; Koenig & Holbrook, 2000c; Ponchillia & Durant, 1995;
The current study extends its investigation of these research interests to the educational
context of Taiwan.

In Taiwan, very little literature can be found in the research database about braille
teaching issues, not to mention teachers’ perspectives of braille literacy and instruction.
Out of 194 articles written between 1970 and 2006 that discussed either visual
impairments or education for students with visual impairments, only 20 were directly
related to braille instruction. The primary foci of these writings were student’s braille
reading skills, braille literacy teaching and learning, braille-related technology products,
and introduction of braille knowledge and information. Only two literature sources, by
Lin (2002b) and Tsai (2004), touched upon teachers’ competency in braille literacy and
braille instruction in classroom settings.

The current study contributes to the literature with its exploration of teachers’
educational backgrounds for teaching braille literacy to young and beginning braille
students in different types of programs in Taiwan. That is, it considers teachers’
competencies of and attitudes toward braille literacy as they relate to their instructional
approaches in classroom settings. Additionally, the study explores teachers’ instructional
strategies for developing emergent-, early braille literacy-, and beginning formal literacy teaching programs for kindergarten through second grade in Taiwan. Finally, the current study makes a significant contribution to the literature, in its exploration of Zhùyīn braille— the braille system that represents the phonetic elements of Chinese language and is exclusively used in Taiwan. Based on her findings, the investigator aims to provide suggestions to teacher training programs that prepare pre-service and in-service teachers to work with visually impaired students in Taiwan.
CHAPTER 3

METHODOLOGY

In this chapter, the investigator will delineate the design of the study and the procedure of data collection. The chapter will first describe the research design, rationale, and purpose of using the research methods. Next, it will describe the investigator’s role and the criteria of participant selection for the study. Then, the procedure for data collection, the results of data collection, and data analysis will be specified. Since the current study was conducted with participants using Chinese, a section is included to discuss the procedures of validating the translations for the research instruments (survey and interview questions) from Chinese to English and back to Chinese, followed by a section regarding the trustworthiness of the current study.

The Research Design

Mixed methods research, a creative research alternative in the social sciences, applies both qualitative and quantitative perspectives in the design, collection, and analysis of data to address the research questions (Teddle & Tashakkori, 2003). Researchers have conducted mixed methods research in social and behavioral sciences throughout the 20th century; however, this approach did not get as much attention as positivist and constructivist methodologies until recently, when researchers found the incompatibility in both paradigms since the 1990s. Tashakkori and Teddle, the editors of...
Handbook of Mixed Methods: In Social and Behavioral Research, are convinced that this approach excels the single approach design for many reasons. They explain that (a) “mixed methods research can answer research questions that other methods cannot,” (b) it “provides better (stronger) inferences,” and (c) “provides the opportunity for presenting a greater diversity of divergent views” (Tashakkori & Teddlie, 2003, pp. 14-15).

Newman, Ridenour, Newman, and Demarco (2003) argued that the purpose of research, in addition to answering the research question, usually includes the researcher’s deeper purposes which guide the reason for conducting the study. For example, the researcher may intend to predict, add to the knowledge base, measure change, understand complex phenomena, inform constituencies, and examine the past from a single study. Since mixed methods research particularly concerns the linkage of the research purposes, methods, and implications of the findings, Newman and his colleagues (2002) believed that it is beneficial to use this approach in a study with complicated purposes, because the approach has the capacity to allow the researcher to focus on one issue or question from various perspectives.

The term “triangulation,” first applied in literature by Denzin in his article regarding naturalistic inquiry published in 1978, became a significant characteristic of mixed methodology during the time period between 1970 and 1990. Tashakkori and Teddlie (1998) explained:

Denzin’s concept of triangulation involved combining data sources to study the same social phenomenon. He discussed four basic types of triangulation: data triangulation (the use of a variety of data sources in a study), investigator triangulation (the use of a variety of several different researchers), theory triangulation (the use of multiple perspectives to interpret the results of a study), and methodological triangulation (the use of multiple methods to study a research problem). (p. 41)
Greene, Caracelli, and Graham (1989) examined 57 research projects that used a mixed methods design and summarized the following five purposes for mixed methods evaluation designs: triangulation, complementarity, development, initiation, and expansion (Table 3.1). Although they found out that, according to their definition, the term “triangulation” was misused in their review of literature, the purposes of triangulation and of complementarity are indicated in the rationales as the major advantages for more than 50% of the reviewed projects. The current study benefits from triangulation to analyze the data, which will be specified later in this chapter.

As indicated by Tashakkori and Teddlie (1998), the mixed methods approach is especially important in education research when the topics are associated with multifaceted factors in a complex educational or social context. Using mixed methods in the present study about teachers’ perspectives of braille literacy and braille instruction carries the possibility of collecting rich data in a variety of ways. The issue becomes complicated, since the children and their teachers are relatively few in number and are dispersed throughout the country. The investigator concluded that the advantage for using a mixed methods design for this study lies in combining procedures from quantitative and qualitative research to determine the current status of teachers’ professional knowledge and instructional practice in fostering braille literacy in Taiwan, and to uncover teachers’ reasons for conducting their practice as they do. In addition, the investigator was able to verify information collected from one source, a written survey, with information collected in other ways, from an official governmental document and interviews, which offered opportunities to clarify or expand ideas.
<table>
<thead>
<tr>
<th>Purpose</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRIANGULATION</td>
<td>To increase the validity of constructs and inquiry results by counteracting or maximizing the heterogeneity of irrelevant sources of variance attributable especially to inherent method bias but also to inquirer bias, bias of substantive theory, biases of inquiry context.</td>
</tr>
<tr>
<td>COMPLEMENTARITY</td>
<td>To increase the interpretability, meaningfulness, and validity of constructs and inquiry results by both capitalizing on inherent method strengths and counteracting inherent biases in methods and other sources.</td>
</tr>
<tr>
<td>DEVELOPMENT</td>
<td>To increase the validity of constructs and inquiry results by capitalizing on inherent method strengths.</td>
</tr>
<tr>
<td>INTIATION</td>
<td>To increase the breadth and depth of inquiry results and interpretations by analyzing them from the different perspectives of different methods and paradigms.</td>
</tr>
<tr>
<td>EXPANSION</td>
<td>To increase the scope of inquiry by selecting the methods most appropriate for multiple inquiry components.</td>
</tr>
</tbody>
</table>

Table 3.1: Purposes for mixed-method evaluation designs.
The Investigator’s Role

The investigator is originally from Taiwan and has been living in the United States since 1996, studying at the university level. The investigator finished her undergraduate coursework in the field of early childhood education. She never had formal training or experience teaching students with visual impairments. In the last ten years, she has been concerned about individuals’ self-identity and voice in a specific social context. She has academically expanded this concern to include specialized teachers in the professional community. She understands that, among all teachers of students with special needs, those of students with visual impairments represent the smallest population of educators among all disability categories (Heward, 2006; Huebner, 2000; The Ministry of Education in Taiwan, 2006). For her, the group of teachers of students with visual impairments, if not marginalized, accounts for a minority population in the teachers of students with special needs whose voices need to be heard from various perspectives. Likewise, braille instruction may be one of the most specialized areas in the extended core curriculum for students with visual impairments. A teacher of students with visual impairments (vision teacher) may not engage braille teaching in the majority of the time, but braille skills are definitely required of a portion of students.

The investigator would like to know how Chinese language is taught in the braille format to young visually impaired students and make a contribution to the literature of braille instruction study in her homeland in Taiwan. Thus, she sees her status in the study as a beginning researcher, an explorer in the area of braille instruction, and a mediator between the small group of teachers and the public. Throughout the study, she reiterates her status and goals of the study to the participants as sincerely and truly as possible.
The Participants

The participants for this study were in-service teachers who were certified to teach students with visual impairments in Taiwan, and were teaching or had taught in kindergarten, first-, and second-grade levels in residential schools, resource classrooms, or itinerant programs. According to the 2005-2006 Special Education Annual Statistics Reports (The Ministry of Education, 2006), during the academic year of 2005-06, the total number of certified teachers of students with visual impairments from kindergarten to senior high school levels was 284 (Table 3.2). The participants in the study were recruited according to their braille teaching experiences and their students’ braille learning levels.

<table>
<thead>
<tr>
<th>Type of Program</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential/Special School</td>
<td>109</td>
</tr>
<tr>
<td>Resource Room</td>
<td>92</td>
</tr>
<tr>
<td>Vision Itinerant</td>
<td>83</td>
</tr>
<tr>
<td><strong>Total Number of Teacher</strong></td>
<td><strong>284</strong></td>
</tr>
</tbody>
</table>

Table 3.2: 2005-2006 total numbers of certified teachers of teaching students with visual impairments – kindergarten through senior high school.
Procedure for Data Collection

In the current study, three strategies were used for data collection: document analysis, surveys, and in-depth interviews. The section will first discuss the document used to collect data and the design of research instruments. Next, it will explain the procedures of data collection for the survey and the interviews. In each practice, the investigator specifies the procedure of recruiting participants and the methods of collecting information.

The Official Document and the Design of Research Instrument

The Official Document

The official document about special education in Taiwan, entitled *The Guidelines of Content Courses and Credit Hours for Pre-Service Special Educators*, was retrieved in 2005 from the website of Taiwan’s Ministry of Education. The document used in the current study was amended in October 2003, the latest version available at the time of the data collection. The document specifies the course offering guidelines for the teacher preparation programs in academic institutions. The information is useful for anyone interested in pursuing the teaching profession for students with special needs.

The original version of the document included both general education coursework and specialized (education for students with special needs) coursework. The current study only adapted the latter to address the research question (Appendix C). The investigator translated the contents of the document and verified with a professor in the field of
teaching students with visual impairments. The list of courses in the document was also used to design the survey item for the current study, which will be discussed in the design of the instrument.

The document describes the required and elective courses, and minimum credit hours that a pre-service teacher should complete in order to be a qualified special educator. According to the guidelines, the investigator was able to identify the overall coursework, including general special education and vision-related courses that an in-service teacher of students with visual impairments might have finished before his/her classroom teaching.

*The Teachers’ Braille Training Survey*

The survey used in this study was adapted from Wittenstein’s (1993b) “Teachers’ Attitudes Survey” to collect vision teachers’ pre-service braille training, braille teaching status, confidence regarding braille knowledge and instruction, and teachers’ beliefs about and expectations for braille literacy education in the United States. His survey has been widely recognized in the preparation of teachers for students with visual impairments. The investigator obtained verbal permission from the author on April 12, 2004 (2004 Council for Exceptional Children Convention, New Orleans) to modify and use his survey for this study. The investigator then analyzed the contents of the survey and modified the critical issues based on the contemporary context of education in Taiwan.

In the present survey design, the item of “All teachers of blind and visually impaired learners should be certified braille transcribers” was removed, because there is
no certification for braille transcribers in Taiwan. A new item which was adapted from *The Guidelines of Content Courses and Credit Hours for Pre-Service Special Educators* lists fifty content courses for special educators in Taiwan to understand teachers’ professional training in general special education and the specific field of education of visually impaired students (Appendix C). The result of these modifications was *The Teachers’ Braille Training Survey* (Appendix D1).

The survey is composed of two sections. The first section includes fourteen items about teachers’ educational background, their current and past teaching experiences, courses they took on teaching students with special needs, and teachers’ learning experiences in braille training programs. Responses to those items are dichotomous (yes/no), single choice, multiple answers, and open-ended descriptive writing. The second section of the survey contains seventeen 5-point Likert scale questions, one single-choice item, and one open-ended item to explore teachers’ feelings, attitudes, and opinions toward braille as well as issues related to braille instruction.

*The Teachers’ Braille Instruction Interview Inventory*

The questions designed for the in-depth interview were based on the findings and comments of the existing research reports. The interview inventory involves a list of literacy practices in early literacy classrooms in which teachers of students with visual impairments may engage in order to establish braille competency in their students. As mentioned earlier, Koenig and Holbrook (2000c) examined the roles of teachers of students with visual impairments in the United States and identified important literacy skills for visually impaired students. They outlined twelve skill areas for braille
instruction. The investigator used three skill areas: “Emergent Braille Literacy,” “Early Formal Braille Literacy,” and “Beginning Braille Literacy” to create the main developmental stages of the interview inventory. Three other skill areas, “Listening, aural-reading, and live-reader skills,” “Technology Skills,” and “Slate-and-Stylus Skills,” were examined and integrated the skills appropriately into the three developmental stages. All area skills of the interview inventory were relevant to the present research (Appendix D2).

In the inventory, the item descriptions were arranged by students’ braille literacy developmental stages. In each stage, the item descriptions were categorized by the following teaching practices: (a) strategies or activities to motivate students’ braille learning; (b) working with parents and other professionals in children’s braille learning; (c) enhancing students’ auditory skills; and (d) strategies to bridge students’ current braille skills with the advanced skills in the next developmental stage. Based on Corn and Koenig’s explicit descriptions for each braille skill area, the investigator drew example activities from the literature for braille literacy instruction as well as for regular literacy instruction from Olson (1981), Pogrund (2000), Stratton (1996), and Wormsley and D’Andrea (1997).

Procedure of Data Collection

Since the statistics of the total number of teachers was initially retrieved from the website which did not specify teachers’ experiences of braille teaching, the investigator contacted the Office of the Department of Special Education in each city/county for the latest information about certified vision teachers’ teaching assignments in Taiwan. The
department officials verbally provided information of the names of schools where teachers served in the itinerant programs or resource classrooms. The school administrators in the four residential/special schools for the visually impaired were also contacted for the study.

The Surveys

To distribute The Teachers’ Braille Training Survey to the teachers, the investigator contacted each school and spoke with the appropriate administrators, usually the program leader of special classes or the director of the student counseling and guidance center. Then the investigator requested the administrators’ assistance to distribute the survey. The investigator also made similar phone calls to the residential school administrators. Table 3.3 shows the results of the final investigation.

Copies of the survey and a project description were sent to the administrators who agreed to distribute the surveys to qualified participants (Appendix D1, E1, & E2). Since some certified in-service teachers also served in administrative positions in the Office of the Department of Special Education, copies of the survey were also sent to the city/county Department Offices. In summary, 135 surveys were sent out to 90 teachers in itinerant programs, 28 teachers in residential schools, nine in resource classrooms and eight administrators/teachers in the Office of the Department of Special Education (Table 3.3). One week after the surveys were mailed, the investigator sent a reminder letter to the administrators to ensure that qualified participants had received the survey (Appendix F).
### Table 3.3: 2005-2006 Numbers of certified teachers who were working with kindergarten and elementary school students with visual impairments in Taiwan (reported by the Department of Special Education on 10/31/2005).

<table>
<thead>
<tr>
<th>City/County</th>
<th>Spec.¹</th>
<th>Resc.²</th>
<th>Itin.³</th>
<th>Dep of Sp Ed.⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Northern Region</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keelung Cty</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taipei Cty</td>
<td>5⁵</td>
<td>8</td>
<td>10²⁵</td>
<td>4</td>
</tr>
<tr>
<td>Taipei Co</td>
<td>12²</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taoyuan Co</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hsinchu Co</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miaoli Co</td>
<td>5⁵</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yilan Co</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spec. Subtotal</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resc. Subtotal</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Itin. Subtotal</td>
<td>43</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dep of Spe Ed Subtotal</td>
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<tr>
<td>TOTAL</td>
<td>60</td>
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<th>Resc.²</th>
<th>Itin.³</th>
<th>Dep of Sp Ed.⁴</th>
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</thead>
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</tr>
<tr>
<td>Taichung Cty</td>
<td>2</td>
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</tr>
<tr>
<td>Taichung Co</td>
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<td>1²⁵</td>
<td>9</td>
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<tr>
<td>Changhua Co</td>
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<tr>
<td>Nantou Co</td>
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</tr>
<tr>
<td>Yunlin Co</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Hualian Co</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
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<td>Chiayi Cty</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Chiayi Co</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
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<tr>
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<tr>
<td>Dep of Spe Ed Subtotal</td>
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<th>Resc.²</th>
<th>Itin.³</th>
<th>Dep of Sp Ed.⁴</th>
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<td><strong>Southern Region</strong></td>
<td></td>
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<tr>
<td>Tainan Cty</td>
<td>4²⁵</td>
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<td>Kaohsung Cty</td>
<td>8</td>
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<td>4²⁵</td>
<td></td>
</tr>
<tr>
<td>Kaohsung Co</td>
<td>3³⁵</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Pingtung Co</td>
<td>1</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Taitung Co</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Penghu</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kinmen Co</td>
<td>1</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>30</td>
<td></td>
<td>135</td>
<td></td>
</tr>
</tbody>
</table>

**Note:**

1. The numbers of teachers teaching early and beginning braille students in special/residential schools.
2. The numbers of teachers teaching early and beginning braille students in resource classrooms.
3. The numbers of teachers teaching early and beginning braille students in itinerant programs.
4. The numbers of certified teachers affiliated with the departments of special education serving in administrative positions and also providing direct service to students with visual impairments when necessary.
5. The city/county where teachers were recruited to the interview (by itinerant program, resource class or residential school).
The Interviews

The participants for the interviews came from cities/counties with the highest number of certified vision teachers reported in the official website of the Ministry of Education and from three residential/special schools for the visually impaired. Although each itinerant teacher may have his or her teaching and traveling schedule, some teachers of programs meet regularly in their county resource centers. Therefore, the investigator attended one of the regular meetings in each program, where she was able to introduce the study, distribute *The Teachers’ Braille Instruction Interview Inventory* (Appendix D2), a letter of introduction (Appendix E3), and a postage-paid postcard (Appendix G), and invite teachers to participate in an interview. Those who were willing to participate in the interview were asked to return the postcard within two weeks and indicate their preferred days and times for an interview. Teachers in the special/residential schools were invited to participate in this study during a regularly scheduled faculty meeting, and the investigator followed the same procedures as designed for recruiting itinerant teachers.

The participants received *The Teachers’ Braille Instruction Interview Inventory* before the interviews. Although the interview conducted in the present study is semi-structured with great flexibility in the sequence and breadth of questions, the conversation was still guided by the interview inventory. Each participant first reviewed *The Teachers’ Braille Training Survey* and then responded to questions from *The Teachers’ Braille Instruction Interview Inventory*. The investigator took notes and used a digital audio-recorder to record each interview.

At the beginning, the investigator and the participant(s) introduced themselves. Then the investigator provided the blank *Teachers’ Braille Training Survey* for the
participants’ reference during the interview. The participants were encouraged to discuss their experiences with and opinions about braille training and related issues, followed by the interview regarding their braille literacy instruction.

Due to the investigator’s limited experience of working with teachers of students with visual impairments in Taiwan and the shortage of knowledge in their professional tasks, the investigator conducted interviews with the first three participants by asking about their experiences with each of the items in *The Teachers’ Braille Instruction Interview Inventory*, following the sequence of items as they were arranged in the *Inventory*. By doing so, the investigator was able to sketch a basic idea of a vision teacher’s teaching practice in Taiwan. As a result, the investigator obtained some information about vision teachers’ braille instruction in Taiwan, possible responses that teachers may make toward certain item descriptions, and appropriate questioning skills that may solicit more information from each participant.

Then, the investigator modified the interview method for the remaining fifteen participants. As mentioned before, the interview inventory is divided into three braille developmental stages. The investigator collected the participants’ braille teaching experiences from their self introduction in the beginning and their reflections on the survey. Thus, the investigator was able to choose the braille developmental stage(s) from which questions would be drawn. Specifically, because of the participants’ differing teaching assignments and various ranges of students in the programs, the learning skills described in *The Teachers’ Braille Instruction Interview Inventory* were not applicable to all participants. For this reason, some items were omitted. For example, if the itinerant teacher had never taught students at the kindergarten level and the student had already
developed pre-braille skills, the items in the “Emergent Braille Literacy” section were omitted and, instead, the focus was placed on the development of young pupils’ beginning braille skills in regular elementary school settings.

In the interview inventory, questions in each stage cover the questioning subjects of (a) strategies or activities to motivate students’ braille learning; (b) working with parents and professionals in students’ braille learning; (c) enhancing students’ auditory skills; and (d) strategies to bridge students’ current braille skills with the advanced skills in the next developmental stage. Therefore, instead of asking specific questions by the interview inventory, the investigator asked general questions, such as: “Tell me, how do you teach braille to a young student right from the beginning? How do you begin?” “Generally, how’s your students’ parents’ involvement in their children’s braille learning? How do you work with them?” During the conversation, the investigator would prompt specific braille teaching questions in the interview on a pertinent matter.

At the end, the investigator provided her contact information to the interview participants and encouraged them to schedule another time to meet if they wished to further discuss anything. The investigator also obtained the participants’ mailing or email addresses and promised to send them the typed transcripts of the interview to confirm the accuracy and clarity of information.

The Results of Data Collection

The Surveys

The investigator sent out 135 surveys to 39 regular schools (99 teachers), four residential schools (28 teachers), and five department offices of special education (eight
teachers) in nineteen cities and counties where vision-related educational services were provided in Taiwan. Ninety-four of the 135 surveys were returned during two months (from April, 2006 to June, 2006). The survey return rate was 69.6% which is considered better than typical return rates of 20% to 33% for mail surveys (Berends, 2006). No incentive of any kind was offered; only an explicit introductory letter (Appendix E2) to the survey receivers and a reminder letter (Appendix F) to the responsible administrator who would distribute the survey for the investigator were sent.

Since the present study aims to investigate in-service teachers’ teaching status, training experiences, and their opinions about current critical issues and related policies, the following qualifications were necessary for participating in the study: must be in-service teachers with certification of teaching students with visual impairments, and must have completed no less than 90% of the survey or at least thirty items of the questions. After the initial screening of the returned surveys by response to Survey Item #1 (hereafter as SI#1: I am a teacher of the blind and visually impaired certified by the Department of Education - Yes/No), the investigator eliminated nine surveys that were from uncertified respondents and four surveys were eliminated because of undefined certificate status. Three teachers who only finished the first fourteen items (the information of current teaching status in the first section) and two retired teachers were also excluded from the study. Therefore, the total survey sample was 76, which was 56.3% of all the 135 distributed surveys or 80.9% of the 94 returned surveys.

The strengths of the current study are the large sample size comprising almost half of all teachers of visually impaired children in Taiwan and the high survey return rate. As indicated above, during 2005-2006, the total number of certified vision teachers
with students from kindergarten to senior high school levels (age 4 to 18) during the school year of the study (Table 3.2) was 284. Given that the statistics did not provide the grade levels that teachers were teaching, it is assumed that a number less than 284 is approximate to the actual total number of teachers who had taught (pre)braille to students. Therefore, the 76 survey participants represent a trustworthy sampling number of certified teachers in Taiwan who were teaching or had taught braille to young students or beginning braille learners.

Since the responses toward the first section of the fourteen item descriptions varied by each teacher’s situation, teaching, and training experience, the analysis for each item depended on the purposes of the research questions. The second section of the survey contains seventeen 5-point Likert scale questions and all 76 respondents are asked to provide a single response to each item description. However, since the item descriptions in SI#15 and SI#16 intended to ask the respondents’ feelings about their braille and teaching competency after their initial participation in the braille training programs, these two items were not applicable to the seven respondents who indicated never having taken a braille training course in SI#6 (I never had any braille training). Therefore, if there was no missing data in the two items, the total number of responses for each item was expected to be 69.

In order to understand the responding tendency of the group, survey items SI#15 through SI#31 were analyzed by their actual responding total numbers. It is understandable that SI#15 and SI#16 had more missing responses than other items
because the items asked the respondents to recall a specific learning area in their teacher preparation programs. Table 3.4 presents the expected total numbers, the numbers of missing data, and the actual responding total numbers for the seventeen survey items.

<table>
<thead>
<tr>
<th>Item #</th>
<th>Expected Total</th>
<th>Missing #</th>
<th>Actual Total</th>
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</thead>
<tbody>
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<td>4</td>
<td>65</td>
</tr>
<tr>
<td>16</td>
<td>69</td>
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<td>76</td>
<td>2</td>
<td>74</td>
</tr>
<tr>
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<td>76</td>
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<td>76</td>
</tr>
<tr>
<td>21</td>
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<tr>
<td>31</td>
<td>76</td>
<td>0</td>
<td>76</td>
</tr>
</tbody>
</table>

Table 3.4: The expected total numbers and the actual total responding numbers for the survey items.
Interviews

The interviews were scheduled after the investigator had obtained the names and locations of willing teachers and their preferred days and times. All but two interviews were conducted with one teacher at a time. Two interviews were conducted with two teachers together.

The interview participant recruitment began in March of 2006 with the investigator’s initial contacts with school administrators for survey distribution. After two meetings with itinerant teachers during their regular staff meetings, the investigator found she had greater success with recruitment by direct contact rather than during teachers’ meetings. A number of teachers declined to participate because of the time of year when student evaluations for placement in the city/county were due. Therefore, the investigator used three recruiting channels: (a) the investigators’ personal contacts; (b) suggestions from school administrators or responsible personnel; and (c) recommendations from other interviewed participants. The detailed recruitment information is listed in Table 3.5.

Initially, 22 teachers who reported their willingness to participate in the interview were selected by location (the northern, middle, and southern region of Taiwan) and program type (special school, itinerant program, and resource room). However, one teacher withdrew from the interview because she was reluctant to express her personal opinion. Another teacher completed the interview but her interview was not used due to poor recording sound quality. One retired teacher and one uncertified teacher were also eliminated. After removing these four teachers from the initial consent list, the remaining total number of interview participants was eighteen teachers.
<table>
<thead>
<tr>
<th>Type</th>
<th>Source</th>
<th>Initial Number</th>
<th>Final Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Investigator's Personal Contacts</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Participants received the investigator’s initial school confirmation phone calls for survey distribution.</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>- Participants were experienced teachers known in the field.</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>- Participants were recruited in teachers’ meetings in the resource centers.</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>- Participants had unique teaching responsibilities.</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>School Administrator/Responsible Personnel's Suggestions</td>
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<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Other Interview Participants’ Recommendations</td>
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<tr>
<td></td>
<td>Total</td>
<td>22</td>
<td>18</td>
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</table>

Table 3.5: The sources of participant recruitment.

Among the eighteen interview participants, fourteen were sighted, three were totally blind, and one had a moderate degree of low vision. All participants were recruited from nine cities and counties reported to have the greatest number of vision teachers or unique program organizations. Fifteen one-time interviews were conducted with seventeen teachers (in either an individual or pair-up pattern) and one lengthy interview with one teacher required two meetings to complete. Table 3.6 lists the code names of all interview participants by their primary service programs.

The following section reports some findings related with the interview method. As mentioned before, the investigator needed to obtain some basic knowledge about the teachers’ practical braille teaching experiences in Taiwan. She assumed that investigating
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<tr>
<th>Itinerant Program</th>
<th>Residential School</th>
<th>Resource Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher A</td>
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<td>Teacher Q</td>
</tr>
<tr>
<td>Teacher B</td>
<td>Teacher L</td>
<td>Teacher R</td>
</tr>
<tr>
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<tr>
<td>Teacher D</td>
<td>Teacher N</td>
<td></td>
</tr>
<tr>
<td>Teacher E</td>
<td>Teacher O &amp; P*</td>
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</tr>
<tr>
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<td></td>
</tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>Teacher J</td>
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<td></td>
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</table>

* both teachers were interviewed together.

Table 3.6: Interview participants’ service programs and their vision characteristics.

teachers’ strategies of teaching specific skill areas in each developmental stage should uncover valuable information in the beginning of interview data collection. The decision to ask the first three participants about their teaching experiences in all items was because some patterns of responses repeatedly appeared since the second interview. For example, all teachers indicated that they did not have time to sit down and guide their student’s fingers to read braille storybooks together. All of them reported that they did not have a chance to get involved in the braille environment arrangement in their students’ regular classes. None of them had ever purposely designed activities to promote students’
auditory skills. When more negative responses were obtained from the more detailed descriptions, the investigator decided to change her interview strategy for the remaining participants.

However, several findings from the interview approach reveal that, first, controlling the expansion of discussion and time consumed in the interview was a great challenge. For example, it took four and a half hours to finish the first participant’s interview. Second, teachers tended to respond to item descriptions in a cross-stage and integrative fashion. For example, a teacher had taught braille to a second-grade student since he was in kindergarten. She illustrated for the investigator all of her efforts to develop the student’s tactile skills right from his pre-braille scribbling stage to the current braille character identification. Therefore, asking about teaching experiences regarding a skill development by a certain stage level may not be appropriate in the study. In the remaining interviews, asking an open-ended question instead allowed the teacher to discuss her teaching experience at whichever level she happens to have something meaningful to say. Thirdly, both the investigator and the participant felt it was tedious and stressful to follow the sequence of the interview inventory. The impact was especially on the broadness and intensity of information that the investigator obtained from the participants.

The last but not least important finding from the interview approach is related to the language developed in the inventory. Initially, the inventory was developed as a script or a reference for the participants’ review, and it was pertinent to use the first person (“I”) to address the statement. However, when the inventory was used as the instrument in an interview, two of the three participants expressed their frustration when they repeatedly
answered “No,” “I didn’t do that,” or “Never” to the investigator’s inquiries. Therefore, rather than asking questions such as “Do you put braille name labels on a classroom?” or “How do you provide opportunities for the braille student to read in a group?” which impose on the teachers what the investigator imagines they should have done, asking open-ended questions would yield responses that truly represent what the teachers do in the classroom.

The findings from the interview approach during the first three interviews indicated that the inventory in the study may be a proper checklist for the participants’ self-evaluation, but, when it is used intact in the interview, it could create an embarrassing situation and could have a negative impact on the participants’ professional confidence. Making the interview questions specific may yield detailed information of a knowledge construct; however, most knowledge is developed through various sources in particular contexts that can only be understood in a meaningful, contextual, and individualized conversation. Therefore, adjustments were made to the Interview Inventory for the remaining 15 interviews.

**Data Analysis**

Data analysis of the study is primarily based on grounded theory. Grounded theory is a concept and strategy proposed by Strauss and Corbin (1994) that is “a general methodology for developing theory that is grounded in data systematically gathered and analyzed. Theory evolves during actual research, and it does this through continuous interplay between analysis and data collection” (Strauss & Corbin, 1994, p. 273). In practice, the researcher develops theoretical ideas beginning with empirical data and
constantly comparative analysis. Schwandt (1997) defines the approach that “simultaneously employs techniques of induction, deduction, and verification to develop theory” (p. 60). Charmaz (2000) analyzed objectivist and constructivist methods in grounded theory and suggested a constructive approach of grounded theory. In this approach, he said, categories and concepts of grounded theory methodology are not driven from the data but developed in the process of interaction with the field and the questions that are asked.

In the current study, grounded theory provides a methodological foundation that is especially helpful in developing categorical structure for data analysis during the processes of research design, data collection, and analysis. Initially, two sources of categorical data systems were derived from (a) the investigator’s examining the survey items and the document, and (b) the investigator’s observations during the interviews. Next, after completion of data collection, recording, and the first round of the data analysis (i.e., calculating the quantitative data, examining the contents of the document, and coding the qualitative data into the individual categories), the investigator re-reviewed, compared, combined, and organized all of the categories generated from each data source. Consequently, the investigator developed a three-thematic coding system to integrate various formats of data (i.e., numeric and descriptive data) collected from the surveys, the official document, and the interviews. The following sections will first discuss the two sources of data and their analytic categories. Next, the sections will describe the structure of the three-thematic coding system and the method to answer the research questions.
Data Source 1: The Teachers’ Braille Training Survey and the Document of the Guidelines of Content Courses and Credit Hours for Pre-Service Special Educators

The initial set of nine analytic categories of the study was derived from the survey responses and the document of the content course guidelines for pre-service special educators in Taiwan. The analytic categories of item description and the related items are presented in the following categories: (a) current teaching assignment (SI#2); (b) current caseload (SI#3); (c) years of teaching experience (SI#4); (d) primary reading mode (SI#5); (e) braille training experience (SI#6 through SI#10, #12); (f) coursework completed for teaching certification (SI#13 and the document of content course guidelines); (g) competency of braille knowledge and instruction (SI#15 through SI#20); (h) opinions about crucial issues (SI#21 through SI#32); and (i) suggestions for teacher training programs (SI#11, #14 and #33).

All of the survey responses were recorded with Microsoft Office Excel, which was chosen for its great accessibility, compatibility, and feasibility. The responses to the first five items (SI#1 through SI#5) were reported by numeric counts, means, median, standard deviation, and percentage. Table 3.7 presents the reporting formats of the findings for the remaining 28 survey items (SI#6 through SI#33). Survey items SI#15 through SI#31 were designed to gain the respondents’ attitudes by asking them to mark their choices on the 5-point Likert scale. For the analysis of the seventeen items, the responses were first reported by the frequency for each point in each item to gauge the responding tendency. Next, the five points were collapsed into three attitudinal classes: positive attitude (strongly agree and agree), neutral attitudes, and negative attitudes.
<table>
<thead>
<tr>
<th>Research Question</th>
<th>Data Source 1</th>
<th>Data Source 2</th>
<th>Data Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What are the educational backgrounds of the participants who teach braille literacy to young and beginning learners in Taiwan?</td>
<td>Data Source 1 Item: 1, 6-10, 12-13, 15-20 • The Ministry of Education (2003). The Guidelines of Content Courses and Credit Hours for Pre-Service Special Educators</td>
<td>Data Source 2 Interview Item: 11, 14, 33 • Self-introduction • (Survey Review) Description of training experience • Description of teaching strategies and curriculum design</td>
<td>Data Format Numeric count • Mean • Percentage • Standard Deviation • Descriptive Summary</td>
</tr>
<tr>
<td>2. What are the differences and similarities in availability of instructional resources for teachers in different educational environments?</td>
<td></td>
<td>Data Source 2 Interview • Description of working with family, school, and community</td>
<td>Data Format Descriptive Summary</td>
</tr>
<tr>
<td>3. What are the approaches or techniques used by teachers to implement braille literacy practices?</td>
<td></td>
<td></td>
<td>Data Format Descriptive Summary</td>
</tr>
<tr>
<td>4. What are teachers’ concerns about braille instruction?</td>
<td>Data Source 1 Item: 21-32 • Description of teaching experience with young and beginning braille students • Description of teaching strategies and curriculum design</td>
<td>Data Source 2 Interview • Description of teaching strategies and curriculum design – Critical concerns about braille literacy</td>
<td>Data Format Numeric count • Mean • Percentage • Standard Deviation • Descriptive Summary</td>
</tr>
<tr>
<td>5. What recommendations do in-service teachers of young visually impaired children suggest to enhance braille literacy instruction curricula in teacher preparation programs?</td>
<td>Data Source 1 Item: 11, 14, 33 • Expectations and reflections that indicate the need to improve the teacher training programs • Suggestions of educational regulations for policymakers</td>
<td></td>
<td>Data Format Descriptive Summary</td>
</tr>
</tbody>
</table>

Table 3.7: The data sources and the analysis display formats.
(disagree and strongly disagree). Unlike Wittenstein (1993b), who designed the three attitudinal classes for statistical purposes, the investigator used the classification in the current study only to understand the respondents’ general attitudinal inclinations.

**Data Source 2: The Teachers’ Braille Instruction Interview**

The second set of three analytic categories comes from the processes of conducting the interviews and analyzing the interview transcripts. While the survey responses and the document would provide data from a large group of teachers’ caseloads, professional training, and attitudes toward critical issues; the interviews from selected teachers provided most descriptive information about classroom teaching and curriculum design.

Although the questions asked in each interview vary by each participant’s situation and context, the investigator acquired the participants’ responses to questions in *The Teachers’ Braille Instruction Interview Inventory* according to the following four questioning areas: (a) Strategies or activities to motivate students’ braille learning (Interview Item #1, #4, #7, #8, #9, #11, #12, #14, #15, #17, #18, #19, #20); (b) Working with parents and other professionals in children’s braille learning (Interview Item #2, #5, #6, #11, #12, #13, #16, #18, #19); (c) Enhancing students’ auditory skills (Interview Item #3, #10, #20); and (d) Strategies to bridge students’ current braille skills with their advanced skills in the next developmental stage (Interview Item #6, #13, #16, #20).

Through the process of asking these four areas of questions during the interview, the investigator found that more refined ideas emerged from the developing conversation with the participants and from reviewing the survey items and document descriptions (the
nine analytic categories in Source 1). Parts of the refined ideas include low vision students’ braille learning, teaching Zhùyīn fúhào (the sound-annotating transcription system) to braille students, braille teaching strategies for visually impaired students with other disabilities, using technology in braille instruction, and teacher-made braille teaching materials. With the information growing in an unexpected amount and intensity, in the time of data collection, the investigator could only identify three themes that emerged from the interviews: (a) teacher characteristics; (b) teaching environment; and (c) teaching strategies and curriculum design (Figure 3.1).

Figure 3.1: Interview participants’ responding themes regarding braille instruction.
Overall, the investigator recorded 41 hours of interviews from the eighteen participants and typed all the intact interview contents into 556 pages of single-spaced Chinese transcripts. The qualitative data analysis software NVivo 2.0 was used to assist the descriptive data organization in the study. Even though the software was utilized in the process of analyzing qualitative information, it was only useful for organizing the raw data for an integrated display. The investigator reviewed and re-reviewed and designated 53 categories under the three themes.

*The Development of Three-Thematic Coding System*

After the investigator examined, combined, and re-organized the 62 categories generated from these raw data (nine in *Source 1* and 53 in *Source 2*), an integrated coding system was established to answer the current research questions. The three analytic themes, which were taken from *Source 2*, are (a) teacher characteristics, (b) teaching environment, and (c) teaching strategy and curriculum design.

The first theme, teacher characteristics, is related to the data of teachers’ professional qualities shown in survey responses or self-reported information in the interview (i.e., teachers’ professional competencies, educational philosophy and beliefs, in-service teaching reflections, or suggestions to the field). Two categories and five subcategories were included in the theme to address the teachers’ professional quality and their insights or reflections from the teaching field (Figure 3.2).
The second theme, teaching environment, is related to the data of contextual factors that may influence braille instruction practice in the classroom (i.e., course arrangement in different placements, teaching resources or support from local educational agencies, school districts, or family intervention). Three categories and seven subcategories were included in the theme to address the influential factors that affected the teachers’ classroom teaching (Figure 3.3).
The third theme, teaching strategy and curriculum design, specifies the details of braille pre-requisite skills, teaching strategies and curriculum design, learning assessment, and braille-related issues and concerns (i.e., the IEP team’s decision-making, the importance of teacher-made braille learning materials, or the impact of technology on braille teaching and learning). Three categories and nine subcategories were included in the theme to indicate the participants’ classroom teaching and concerns for their young and beginning braille students’ literacy learning (Figure 3.4).
Figure 3.4: The analytic theme of teaching strategies and curriculum design.
The three-thematic coding system not only helps the investigator to organize the various data formats from different sources, but also provides the investigator a valuable conceptual framework of the data to answer the research questions. All of the themes, categories, and subcategories in the coding system emerged from the nature of the data themselves. For example, the statement of “I teach them Zhùyīn fūhào in kindergarten because it is the foundation of Chinese braille in Taiwan” (Teacher N, 05/17/2006) is related to the early formal braille stage (Category#3.1 in Figure 3.4) and the braille prerequisite skill (Subcategory#3.1.1 in Figure 3.4). In the current chapter, the above three figures only show two categorical layers for each theme; however, in Chapter 4, the analytic frameworks for some themes will be structured by multiple layers of subcategories that were not shown in the three figures.

To answer each research question, the investigator reviewed the research questions and assigned the proper coding categories with the data. Consequently, Research Question # 1 was answered by the analysis result of Category#1.1 with its two subcategories (Figure 3.2). Research Question # 2 was answered by the analysis result of Theme#2 with its three categories and seven subcategories (Figure 3.3). Research Question #3 was answered by the analysis result of Category#3.1 and Category#3.2 with their six subcategories (Figure 3.4). Research Question #4 was answered by the analysis result of Category#3.3 with its three subcategories (Figure 3.4). Research Question #5 was answered by the analysis result of Category#1.2 with its three subcategories (Figure 3.2). Table 3.7 specifically demonstrates the data sources for each research question and the data formats (e.g., percentage, standard deviation, or descriptive summary) that will be presented in Chapter 4.
**Triangulation in the Study**

The investigator used grounded theory to structure the participants’ professional backgrounds, braille teaching experiences, and recommendations to the teacher training programs in Taiwan. She also used the methods of survey, document analysis, and interview to obtain both quantitative and qualitative data. Triangulation, one of the most significant principles in mixed methods research, features the current study in data triangulation. The following section is an example of how the data was triangulated for Research Question # 1 (refer to Table 3.7).

In order to understand the research participants’ overall braille training experience, the investigator first examined the survey data for SI#6 through SI#10 and SI#12 regarding the respondents’ experiences of attending braille training programs (including training contents and objectives) and SI#13 regarding the respondents’ enrollment in braille courses. The data formats include numeric counts, means, and percentages. The investigator also examined the official document of *The Guidelines of Content Courses and Credit Hours for Pre-Service Special Educators* to understand the significance of the braille course in all listed courses in the guidelines (in descriptive summary format). Thus, from the analysis of Data Source 1, the investigator understood (a) the legal requirement for certified vision teachers to take the braille course, (b) the statistics of the course enrollment by the survey respondents who were in-service vision teachers, and (c) the statistics of the training contents and objectives indicated in the respondents’ braille training courses.

Next, the investigator reviewed the interview participants’ reflections regarding their braille training experiences (in descriptive summary format). Data Source 2
includes the descriptive information derived from the participants’ self-introduction about their educational backgrounds, the reviewing section for *The Teachers’ Braille Training Survey*, and illustration of their teaching strategies and curriculum design embedded in the participants’ braille training courses. During the interviews, the investigator particularly inquired about the participants’ comments on the contents and objectives of their braille training courses and their feelings about those course arrangements. As a result, this portion of the data obtained from the interview participants provides the power of triangulation and confirmability when examining the data from *Data Source 1*.

**Validation of the Translation of the Research Instruments**

The investigator translated the survey and interview inventory from English into Traditional Chinese for the Taiwanese participants. Three Taiwanese colleagues converted the Chinese translations into English. The back-translation versions (i.e., the new English version converted from the investigator’s Chinese version) were used to obtain the conceptual equivalence of the original English versions. One of the translators was a doctoral candidate in Children’s Literature in the School of Teaching and Learning at The Ohio State University. The second translator was a doctoral candidate in Social and Cultural Foundations in the School of Educational Policy and Leadership at the same university. The third translator was a retired Taiwanese teacher who had taught English courses in a special/residential school in Taiwan for almost thirty years. Upon reviewing the back-translation English versions, the investigator compared them against the original to identify and then correct any discrepancies.
The comparison between the two English versions indicated no significant differences in semantic and content understanding. In *The Teachers’ Braille Training Survey*, the back-translator who did not have an education background herself indicated that she had difficulty with several terms, such as “early intervention,” “braille transcription,” “braille notetaker,” “scanners/optical character recognition system,” and “slate and stylus.” For *The Teachers’ Braille Instruction Interview Inventory*, two translators hesitated using the term “literacy” and preferred to use the term “language.” Recent definitions of “literacy” as distinguished from “language” are still new in Taiwan, though the elements of listening, speaking, reading, and writing have long been recognized as four fundamental elements necessary for one to be considered “literate.”

**Trustworthiness**

“Trustworthiness” is a term used in qualitative research to examine the capacity of the research design to reflect the reality of an experience. As an essential part of qualitative research, trustworthiness aims to establish that a particular qualitative research study is “worth paying attention to” (Lincoln & Guba, 1985, p. 290). Lincoln and Guba suggested four criteria of trustworthiness: credibility, transferability, dependability and confirmability.

In the present study, Wittenstein’s (1993b) Braille Training Survey was modified with the assistance of a member of the dissertation committee whose field of expertise is the education of visually impaired children. The large sample size and the high responding rate of the survey indicate a satisfactory validity of the survey. The interview data collected from the participants were triangulated with the data from the official
document and the survey to assure credibility. The availability of digital recordings of all interviews permitted analysis as designed and assured referential adequacy, again to assure credibility. Member check was used as yet another strategy to assure credibility. Confirmability was assured by emailing each transcription in both Word and PDF file formats to the interview participants and asking them to read over and confirm their interview transcripts. Five of the eighteen participants acknowledged receipt of the transcriptions, and only three out of them indicated some minor corrections which did not influence the information interpreted for the study.

Due to the nature of the study conducted on international participants, the investigator carefully reviewed the website description of the Office of Responsible Research Practices (ORRP) of The Ohio State University (OSU) for required procedures for studies using human subjects (2005). The investigator attempted to obtain the detailed research regulations, rules, and guidelines that were officially publicized by the research institutions in Taiwan (2005). However, the specific instructions for research were only for those studies that involved medical, genetic, and computer-processed personal data. No information or rules for the conduct of research were provided for social and behavioral sciences. The investigator sent the research proposal and required documents to the ORRP in January, 2006 and obtained the research approval from the Institutional Review Board (IRB) at OSU in March, 2006 (Appendix H).
CHAPTER 4

DATA ANALYSIS

In this study, a nationwide survey distribution and in-depth interviews were conducted to collect information from certified teachers of students with visual impairments (vision teachers) in Taiwan who have teaching experiences with young and beginning braille students. Each research question is answered by different portions of responses to the survey items and interview questions. Table 3.7 shows the response sources and formats reported for each research question. In the table, a course guideline taken from *The Guidelines of Content Courses and Credit Hours for Pre-Service Special Educators* (The Ministry of Education, 2003) is also included as the main documentation to examine survey respondents’ basic professional knowledge.

The first section of the chapter discusses the reports of demographic information about the participants’ current service situations and personal characteristics. Data collected from the survey and interviews will then be presented to answer each of the research questions.

**The Participants’ Demographic Information**

Two survey items (SI) addressed the respondents’ teaching situations: *SI#2* - current teaching assignments; and *SI#3* - student caseloads. Two survey items and the
interview data addressed the respondents’ personal characteristics: SI#4 - years of teaching experiences at the time of the survey; SI#5 and interview information indicate the participants’ reading modes.

The Participants’ Current Teaching Situations

Teaching Assignment (Responses to SI#2)

My current teaching assignment can be described as:
(Please check all that apply)

( ) residential school
( ) self-contained class
( ) resource room
( ) itinerant program
( ) consultant service for teachers/parents
( ) early intervention
( ) other ________________________________

The participants responded to all of the descriptions that were applicable to them. Fifty-nine teachers (77.63% of 76 respondents) indicated having a single assignment in the residential school, the resource room, or the itinerant program. Seventeen others reported that they had two or three primary service assignments (Table 4.1). For the teachers who indicated having a single assignment, the majority of teachers indicated the itinerant program (n = 37). For those having multiple assignments, the combination that the majority indicated was teaching in an itinerant program plus providing consultation services to teachers/parents (n = 8).
<table>
<thead>
<tr>
<th>Type</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>One teaching assignment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential school</td>
<td>14</td>
<td>18.42</td>
</tr>
<tr>
<td>Resource room</td>
<td>8</td>
<td>10.53</td>
</tr>
<tr>
<td>Itinerant program</td>
<td>37</td>
<td>48.68</td>
</tr>
<tr>
<td>Two teaching assignments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential school &amp; Itinerant program</td>
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<td>2.63</td>
</tr>
<tr>
<td>Resource room &amp; Itinerant program</td>
<td>2</td>
<td>2.63</td>
</tr>
<tr>
<td>Resource room &amp; Consultation</td>
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<td>1.32</td>
</tr>
<tr>
<td>Itinerant &amp; Consultation</td>
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<td>10.53</td>
</tr>
<tr>
<td>Consultation &amp; Other*</td>
<td>1</td>
<td>1.32</td>
</tr>
<tr>
<td>Three teaching assignments</td>
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<td></td>
</tr>
<tr>
<td>Residential school, Itinerant program &amp; Consultation</td>
<td>2</td>
<td>2.63</td>
</tr>
<tr>
<td>Residential school, resource room &amp; Consultation</td>
<td>1</td>
<td>1.32</td>
</tr>
<tr>
<td>Total</td>
<td>76</td>
<td></td>
</tr>
</tbody>
</table>

* indicates the respondent worked on administrative affairs at the Department of Special Education of the local city/county.

Table 4.1: Teaching assignment(s) reported by participants and interviewees (by number of assignment) (SI#2).
Student Caseload (Responses to SI# 3)

My current caseload is described below:

Number of students ________
Number of dual media (braille/print) users ________
Number of braille users ________
(If none, please indicate the year in which you last worked with a student using braille: _____)

Seventy-two teachers responded to SI#3. The mean number of students taught by all survey respondents was 10.01 with a standard deviation of 5.94, a median of 9.0 and a range from 1 to 30 students (Table 4.2). Altogether, the 72 teachers had 721 students.

This survey item was designed to identify the number of braille users in teachers’ caseloads. Sixty-two of the 72 teachers (86.11%) indicated having 243 students in braille and/or dual reading mode (Table 4.3). Six teachers indicated that braille instruction was not needed by their students at the time of the survey. The interval year since their last braille instruction ranged from 1 to 21 years with a mean of 5.33 years for the 6 teachers.
<table>
<thead>
<tr>
<th># of Students in Caseloads</th>
<th># of Respondents (total = 72)</th>
<th>Caseload (total = 721)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>n</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
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<td>28</td>
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<td>0</td>
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<tr>
<td>29</td>
<td>1</td>
<td>29</td>
</tr>
<tr>
<td>30</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
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<td>721</td>
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Continued

Table 4.2: Teachers’ caseload by number of students at the Time of the Survey (SI#3).
Table 4.2  Continued

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<td>maximum</td>
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</table>

<table>
<thead>
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<th># of Respondents (total = 72)</th>
<th>Caseload (total = 243)</th>
</tr>
</thead>
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<td>Braille Only</td>
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<td>Dual &amp; Braille</td>
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<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
</tr>
</tbody>
</table>

Table 4.3: Teachers’ Caseload by Student Reading Mode (SI#3).
The Participants’ Personal Characteristics

Teaching Experience (Responses to SI# 4)

I have _______ years of total teaching experience.
I have _______ years of experience with visually impaired students.

The mean number of years of teaching experience of all 76 respondents was 12.27 with a standard deviation of 9.19, a median of 11 and a range from 1 to 40 years (Table 4.4). When the total years of teaching experience were grouped by eight 5-year ranges, 26 teachers (34.21% of 76 respondents) reported having total years of teaching experience from 1 to 5 years, followed by 16 teachers (21.05%) with years of teaching experience from 11 to 15 years, and 11 teachers (14.47%) with teaching years from 6 to 10 years.

All 76 teachers’ mean number of years of experience with visually impaired students was 7.55 years with a standard deviation of 5.82, a median of 6, and a range from 0.5 to 28 years (Table 4.4). Thirty-six teachers (47.37% of 76 respondents) reported having years of experience with visually impaired students from 0.5 to 5 years, followed by 19 teachers (25%) with years of experience with visually impaired students from 6 to 10 years and 13 teachers (17.10%) with years of experience from 11 to 15 (Table 4.5).
<table>
<thead>
<tr>
<th>Total Years of teaching experience</th>
<th># of Respondents (total = 76)</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5 yr(s)</td>
<td></td>
<td>26</td>
<td>34.21</td>
</tr>
<tr>
<td>6-10 yrs</td>
<td></td>
<td>11</td>
<td>14.47</td>
</tr>
<tr>
<td>11-15 yrs</td>
<td></td>
<td>16</td>
<td>21.05</td>
</tr>
<tr>
<td>16-20 yrs</td>
<td></td>
<td>7</td>
<td>9.21</td>
</tr>
<tr>
<td>21-25 yrs</td>
<td></td>
<td>9</td>
<td>11.84</td>
</tr>
<tr>
<td>26-30 yrs</td>
<td></td>
<td>4</td>
<td>5.26</td>
</tr>
<tr>
<td>31-35 yrs</td>
<td></td>
<td>2</td>
<td>2.63</td>
</tr>
<tr>
<td>36-40 yrs</td>
<td></td>
<td>1</td>
<td>1.32</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>76</td>
<td>99.99</td>
</tr>
</tbody>
</table>

Mean 12.27  
SD 9.19  
Median 11  
Range:  
  minimum 1  
  maximum 40

Table 4.4: Teachers’ total years of teaching experience (SI#4).
Table 4.5: Teachers’ total years of experience working with visually impaired students (SI#4).

<table>
<thead>
<tr>
<th>Total Years of experience working with visually impaired students</th>
<th># of Respondents (total = 76)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td>0-5 yr(s)</td>
<td>36</td>
</tr>
<tr>
<td>6-10 yrs</td>
<td>19</td>
</tr>
<tr>
<td>11-15 yrs</td>
<td>13</td>
</tr>
<tr>
<td>16-20 yrs</td>
<td>6</td>
</tr>
<tr>
<td>21-25 yrs</td>
<td>1</td>
</tr>
<tr>
<td>26-30 yrs</td>
<td>1</td>
</tr>
<tr>
<td>31-35 yrs</td>
<td>1</td>
</tr>
<tr>
<td>36-40 yrs</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>76</td>
</tr>
</tbody>
</table>

Mean 7.55  
SD 5.82  
Median 6  
Range:  
minimum 0.5  
maximum 28
Primary Reading Mode (Response to SI#5 and Data from Interviews)

[Optional] My primary reading mode is

(   ) braille
(   ) dual media (print & braille)
(   ) print
(   ) tape

Seventy-two respondents indicated one or two types of reading modes to the item description (Table 4.6). Print was the most frequently used mode reported by 62 teachers (86.11% of 72 respondents) with one reading mode; 2 teachers (2.78%) with two reading modes indicated that tape was another mode they liked using in addition to print. Braille was marked by 2 teachers (2.78%) with one reading mode and 3 teachers (4.17%) with tape as another mode in addition to braille. Only 1 teacher pointed out reading in dual mode.

<table>
<thead>
<tr>
<th>Reading Mode</th>
<th># of Respondents (total = 72)</th>
</tr>
</thead>
<tbody>
<tr>
<td>One Reading Mode</td>
<td></td>
</tr>
<tr>
<td>Braille</td>
<td>2</td>
</tr>
<tr>
<td>Dual</td>
<td>1</td>
</tr>
<tr>
<td>Print</td>
<td>62</td>
</tr>
<tr>
<td>Two Reading Modes</td>
<td></td>
</tr>
<tr>
<td>Braille &amp; Tape</td>
<td>3</td>
</tr>
<tr>
<td>Print &amp; Tape</td>
<td>2</td>
</tr>
<tr>
<td>Dual &amp; Tape</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 4.6: Teachers’ reading mode(s) (SI#5).
Responses to the Research Questions

Three types of data are used in the study to answer the research questions: survey responses, interview information, and documentation obtained from the Ministry of Education in Taiwan (Table 3.7).

RQ1: What Are The Educational Backgrounds of The Participants Who Teach Braille Literacy to Young and Beginning Learners in Taiwan?

The question is answered in the following two sections: braille training and other training. In terms of braille training, the participants provided training information by responding to SI#6 through SI#10, SI#12 and SI#15 to SI#20. The interview participants also commented on their training experiences when asked to review the survey items. The participants’ other professional training information is examined by responses to SI#13, which lists 50 courses that are recommended for special educators’ training programs by the Ministry of Education in Taiwan. Finally, types of participants’ other certificates and educational degrees are identified from the responses to SI#1 and the interview questions.

Braille Training

Survey responses. Seven teachers were removed from the 76 survey participants because of their responses to SI#6 (I never had any braille training). Therefore, 69 teachers’ responses to SI#6 through SI#10 were used to report the findings.
SI#7 asked the respondents the type of initial braille course that they had taken:

*I received my initial braille training at:*
*(Please check all that apply)*

- ( ) undergraduate course at University/College___________________________
- ( ) graduate course at University/College______________________________
- ( ) self-instruction courses (e.g. learning materials, online instruction)
- ( ) other_________________________________________________________
- *( ) check here if course was taken as part of a degree program*

As shown in Table 4.7, 32 teachers (46.38% of 69 respondents) completed their initial braille courses in the post-bachelor teacher training programs with most of them taking the braille courses in NUTN and only one reporting that the course was finished in another vision teacher training program. Twenty-six teachers (37.68%) had initial braille training in their undergraduate courses in six teacher preparation institutions. Five respondents indicated that they had their initial braille training in the elementary school ages from their itinerant vision teachers or their residential school teachers. Of all the respondents, the earliest year a braille course was taken by a respondent was 1974. Six respondents stated that taking the braille course was required in their degree programs.

SI#9 was designed to ask the respondents’ braille course objects. A list of learning content was presented for the respondents to check each applicable description. The course objects are shown in Table 4.8. “Instructional materials” was marked by a majority group of teachers (n = 60, 86.96% of all 69 respondents), followed by “Reading methodology” by 55 teachers (79.71%), “Historical perspectives” by 49 teachers (71.01%), and “Braille Readiness” by 49 teachers (71.01%). “Talking calculator,”
Table 4.7: Teachers’ initial braille training by program type (SI#7).

<table>
<thead>
<tr>
<th>Program Type</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate Course</td>
<td>26</td>
<td>37.68</td>
</tr>
<tr>
<td>Post-Bachelor Training</td>
<td>32</td>
<td>46.38</td>
</tr>
<tr>
<td>During Elementary School Years</td>
<td>5</td>
<td>7.25</td>
</tr>
<tr>
<td>School for The Blind In-service Workshop</td>
<td>3</td>
<td>4.35</td>
</tr>
<tr>
<td>Self-Learning Course</td>
<td>3</td>
<td>4.35</td>
</tr>
<tr>
<td>Total</td>
<td>69</td>
<td>100.01</td>
</tr>
</tbody>
</table>

Program Requirement 6

Earliest Year of Course Taken 1974

Latest Year of Course Taken 2005
Table 4.8: Teachers’ responses to course objectives of braille training (SI#9).
“Knowledge and instructional strategies for visually impaired students with additional disabilities” and “collaborative skills with those who have less or no experience in teaching braille to students with severely visual impairments” were three least mentioned contents with an answering rate no more than one third of all respondents (n = 23, 33.33%) in each description. In the six technology-related descriptions, “refreshable braille displays” was the most reported contents by two thirds of survey respondents (n = 46, 66.67%) and “talking calculator” was the least reported description (n = 19, 27.54%).

SI#10 asked participants’ braille learning outcomes in the training course. Twelve outcome descriptions (Table 4.9) were also designed for respondents to check whichever was applicable. Sixty-three respondents (91.30% of 69 respondents) indicated that “Demonstrating proficiency with braillewriter” was expected by the end of the training, followed by “Demonstrating ability to read braille” indicated by 57 respondents (82.61%) and “Developing teacher-made materials for braille instruction” indicated by 56 teachers (81.16%). “Reviewing journal articles related to braille instruction” was the least mentioned in the 12 training outcomes (n = 18, 26.09%). “Presenting sample lessons” (n = 24, 34.78%) and “Evaluating curricula” (n = 25, 36.23%) were two other least mentioned descriptions.

SI#8 intended to explore the amount of respondents’ training experience in teaching methodology of braille reading. The item descriptions and responses are shown in Table 4.10. Twenty-eight respondents (41.79% of 67 respondents) indicated that they received transcription, rule knowledge, formatting and proofreading training in braille courses, but no teaching methodology of braille reading was mentioned in class.
<table>
<thead>
<tr>
<th>Learning Outcomes</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skills of Braillewriter</td>
<td>63</td>
<td>91.30</td>
</tr>
<tr>
<td>Skills of Braille Reading</td>
<td>57</td>
<td>82.61</td>
</tr>
<tr>
<td>Developing Braille Instructional Materials</td>
<td>56</td>
<td>81.16</td>
</tr>
<tr>
<td>Knowledge of Braille Reading Methodology</td>
<td>51</td>
<td>73.91</td>
</tr>
<tr>
<td>Knowledge of Assistive Aids</td>
<td>49</td>
<td>71.01</td>
</tr>
<tr>
<td>Skills of Using Slate &amp; Stylus</td>
<td>46</td>
<td>66.67</td>
</tr>
<tr>
<td>Knowledge of Instructional Technology</td>
<td>43</td>
<td>62.32</td>
</tr>
<tr>
<td>Knowledge of the Nemeth code</td>
<td>38</td>
<td>55.07</td>
</tr>
<tr>
<td>Writing Lesson Plans</td>
<td>30</td>
<td>40.48</td>
</tr>
<tr>
<td>Evaluating Curricula</td>
<td>25</td>
<td>36.23</td>
</tr>
<tr>
<td>Presenting Sample Lessons</td>
<td>24</td>
<td>34.78</td>
</tr>
<tr>
<td>Reviewing Related Journal Articles</td>
<td>18</td>
<td>26.09</td>
</tr>
</tbody>
</table>

Table 4.9: Teachers’ responses to learning outcomes of braille training (SI#10).
Table 4.10: Teachers’ braille training experiences in teaching methodology of braille reading (SI#8).

<table>
<thead>
<tr>
<th>Description</th>
<th>All Respondents (total = 69)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• My braille training includes transcription, rule knowledge, formatting, proofreading.</td>
<td>28  41.79</td>
</tr>
<tr>
<td>• My braille training includes the above plus some (10% of class time) methodology in the teaching of braille reading.</td>
<td>19  28.36</td>
</tr>
<tr>
<td>• My braille training includes the above plus an emphasis (more than 10%) on methodology in the teaching of braille reading.</td>
<td>20  29.85</td>
</tr>
<tr>
<td>Total</td>
<td>67  100.00</td>
</tr>
<tr>
<td>No Response</td>
<td>2</td>
</tr>
</tbody>
</table>
Nineteen teachers (28.36%) reported that some amount (about 10% of class time) of teaching methodology in braille reading was included. The rest (20 teachers or 29.85%) indicated that, in addition to the fundamental knowledge and skills of braille instruction, more than 10% of class time was used to introduce methodology of teaching braille reading.

SI#12 asked teachers’ experience of participating in braille training related to professional development. Table 4.11 shows the types of training programs. Thirty-five respondents (46.05%) marked one type, and 12 teachers (15.79%) indicated two types of training programs in which they participated. In the three types of professional development programs, 32 teachers indicated having attended braille-related conferences and 26 teachers indicated having participated in braille refreshing workshops. Twenty-nine teachers (38.16%) either indicated “None” or did not respond to the item.

SI#15 through SI#20 were designed to tap teachers’ feelings about their own braille competency. The response results are displayed in Table 4.12, followed by the summary of respondents’ attitudes toward each item description in Table 4.13. Responses from the 7 respondents who indicated never taking a braille training course were removed from the analysis of SI#15 and SI#16.

Sixty-five participants responded to the SI#15 (When I completed my braille training I felt that my braille skills were satisfactory), with a mean score of 3.31 (standard deviation = 0.95) (Table 4.12). Twenty-nine respondents (44.62% of all 66 respondents) agreed or strongly agreed with the item description, 22 teachers (33.85%) held a neutral attitude to the description, and 14 teachers (21.54%) disagreed or strongly disagreed with the item description (Table 4.13).
Sixty-five participants responded to SI#16 (*When I completed my braille training I felt that my ability to teach braille was satisfactory*), with a mean score of 2.94 (standard deviation = 0.78). Twenty-eight teachers (42.42% of all 66 respondents) had a neutral attitude toward the item description, 20 teachers (30.30%) disagreed or strongly disagreed with the description, and 18 teachers (27.27%) agreed or strongly agreed with the description.

Seventy-four participants responded to SI#17 (*I currently feel that my braille skills are satisfactory*), with a mean score of 3.18 (standard deviation = 1.01). Twenty-eight teachers (37.84% of all 74 respondents) agreed or strongly agreed with the item description, 27 teachers (36.49%) held a neutral attitude to the description and 19 teachers (25.68%) disagreed or strongly disagreed with the item description.
<table>
<thead>
<tr>
<th>No</th>
<th>Item Description</th>
<th>SA</th>
<th>A</th>
<th>NEU</th>
<th>DA</th>
<th>SD</th>
<th>n</th>
<th>Mean</th>
<th>Max.</th>
<th>Min.</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>When I completed my braille training I felt that my braille skills were satisfactory.</td>
<td>6</td>
<td>23</td>
<td>22</td>
<td>13</td>
<td>1</td>
<td>65</td>
<td>3.31</td>
<td>5</td>
<td>1</td>
<td>0.95</td>
</tr>
<tr>
<td>16</td>
<td>When I completed my braille training I felt that my ability to teach braille was satisfactory.</td>
<td>1</td>
<td>17</td>
<td>28</td>
<td>17</td>
<td>3</td>
<td>66</td>
<td>2.94</td>
<td>5</td>
<td>1</td>
<td>0.78</td>
</tr>
<tr>
<td>17</td>
<td>I currently feel that my braille skills are satisfactory.</td>
<td>7</td>
<td>21</td>
<td>27</td>
<td>16</td>
<td>3</td>
<td>74</td>
<td>3.18</td>
<td>5</td>
<td>1</td>
<td>1.01</td>
</tr>
<tr>
<td>18</td>
<td>I currently feel that my ability to teach braille is satisfactory.</td>
<td>7</td>
<td>20</td>
<td>30</td>
<td>15</td>
<td>2</td>
<td>74</td>
<td>3.20</td>
<td>5</td>
<td>1</td>
<td>0.96</td>
</tr>
<tr>
<td>19</td>
<td>My knowledge of the Nemeth code is satisfactory.</td>
<td>3</td>
<td>15</td>
<td>23</td>
<td>28</td>
<td>5</td>
<td>74</td>
<td>2.77</td>
<td>5</td>
<td>1</td>
<td>0.99</td>
</tr>
<tr>
<td>20</td>
<td>I am confident in my ability to make decisions concerning my students’ learning media.</td>
<td>11</td>
<td>39</td>
<td>20</td>
<td>6</td>
<td>0</td>
<td>76</td>
<td>3.72</td>
<td>5</td>
<td>2</td>
<td>0.81</td>
</tr>
</tbody>
</table>

Note: 1. SA = Strongly Agree; A = Agree; NEU = Neutral; D = Disagree; SD = Strongly Disagree
2. SI#15 & SI#16: total = 69; SI#17 through SI#20: total = 76

Table 4.12: Teachers’ feelings about their braille competency (SI#15 - SI#20).
<table>
<thead>
<tr>
<th>No</th>
<th>Item Description</th>
<th>n</th>
<th>Positive</th>
<th></th>
<th>Neutral</th>
<th></th>
<th>Negative</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>When I completed my braille training I felt that my braille skills were satisfactory.</td>
<td>65</td>
<td>29</td>
<td>44.62</td>
<td>22</td>
<td>33.85</td>
<td>14</td>
<td>21.54</td>
</tr>
<tr>
<td>16</td>
<td>When I completed my braille training I felt that my ability to teach braille was satisfactory.</td>
<td>66</td>
<td>18</td>
<td>27.27</td>
<td>28</td>
<td>42.42</td>
<td>20</td>
<td>30.30</td>
</tr>
<tr>
<td>17</td>
<td>I currently feel that my braille skills are satisfactory.</td>
<td>74</td>
<td>28</td>
<td>37.84</td>
<td>27</td>
<td>36.49</td>
<td>19</td>
<td>25.68</td>
</tr>
<tr>
<td>18</td>
<td>I currently feel that my ability to teach braille is satisfactory.</td>
<td>74</td>
<td>27</td>
<td>36.49</td>
<td>30</td>
<td>40.54</td>
<td>17</td>
<td>22.97</td>
</tr>
<tr>
<td>19</td>
<td>My knowledge of the Nemeth code is satisfactory.</td>
<td>74</td>
<td>18</td>
<td>24.32</td>
<td>23</td>
<td>31.08</td>
<td>33</td>
<td>44.59</td>
</tr>
<tr>
<td>20</td>
<td>I am confident in my ability to make decisions concerning my students’ learning media.</td>
<td>76</td>
<td>50</td>
<td>65.79</td>
<td>20</td>
<td>26.32</td>
<td>6</td>
<td>7.89</td>
</tr>
</tbody>
</table>

Note: $SI#15$ & $SI#16$: total = 69; $SI#17$ through $SI#20$: total = 76

Table 4.13: Teachers’ attitudes about their braille competency ($SI#15$ - $SI#20$).
Seventy-four participants responded to SI#18 (*I currently feel that my ability to teach braille is satisfactory*), with a mean score of 3.20 (standard deviation = 0.96). Thirty teachers (40.54% of all 74 respondents) had a neutral attitude toward the item description, 27 teachers (36.49%) agreed or strongly agreed with the description, and 17 teachers (22.97%) disagreed or strongly disagreed with the description.

Seventy-four participants responded to SI#19 (*My knowledge of the Nemeth code is satisfactory*), with a mean score of 2.77 (standard deviation = 0.99). Thirty-three teachers (44.59% of all 74 respondents) disagreed or strongly disagreed with the item description, 23 teachers (31.08%) held a neutral attitude to the description, and 18 teachers (24.32%) agreed or strongly agreed with the description.

Seventy-six participants responded to SI#20 (*I am confident in my ability to make decisions concerning my students’ learning media*), with a mean score of 3.72 (standard deviation = 0.81). Fifty teachers (65.79% of all 76 respondents) agreed or strongly agreed with the item description, 20 teachers (26.32%) held a neutral attitude to the description, and 6 teachers (7.89%) disagreed or strongly disagreed with the description.

*Interview information.* All certified interview participants obtained their initial braille professional training from three college programs or post-bachelor teacher training programs. When the participants were asked about their braille training experience, their initial thoughts were that the training was no more than “type, type, type,” and “memorizing braille codes and rules.” Teacher K said:
We were only taught to recognize compositions of braille codes (such as numerical names of ㄅ or ㄆ), English braille codes (self-learn uncontracted format by rule chart), and fundamental scientific braille codes … we learned very basic mathematic symbols, such as addition, subtraction, multiplication, and division … the instructor did not emphasize mastery of braille typing skills. You operate a brailler, type words out, turn the assignment in, and then you pass. (Teacher K, 05/16/2006)

Teacher K also reported:

In the braille course, the instructor mentioned braille transcription, rules, formats, and proof-reading … however, for learning literary braille, the instructor simply threw out a book title for us to type after a brief rule introduction. At that time, if the book typing task was done, one was assumed to have “learned” braille. (Teacher K, 05/16/2006)

Teaching methods of braille literacy and materials design were not specified in the braille course, but blended into courses such as “Teaching Methods and Curriculum Design for Students with Visual Impairments” or “Technological Implementation in Education for Students with Visual Impairments.” Several teachers (A, C, E, G and L) indicated that topics like “historical perspectives,” “cooperation skills with school administrators or professionals,” and “knowledge and instructional strategies with visually impaired students and other disabilities” were never mentioned in any course of their training programs. Teacher E asked the investigator: “Is it necessary for us to know the historical development of braille?” (Teacher E, 05/24/2006).

Other Training

Document analysis. According to The Guidelines of Content Courses and Credit Hours for Pre-Service Special Educators, the curriculum guidelines established by the Ministry of Education in Taiwan (2003) (Appendix C), the individual eligible for being a teacher of students with visual impairments (in the field of physical and mental
disabilities) should finish the five general special education courses: (a) Introduction to Exceptional Children; (b) Educational Assessment of Exceptional Learners; (c) Practicum in Special Education Classrooms; (d) Rationales and Practices of Individualized Education Program; and (e) Teaching Methods for Students with Disabilities. Additionally, two courses should be taken from the following four courses to fulfill the field requirement: (a) Contemporary Issues and Trends in Special Education; (b) Behavioral Changing Strategies; (c) Special Child Development; and (d) Parent-Teacher Collaboration and Family Supporting System.

Those who specialize in education for students with visual impairments should finish the following five courses or courses with the equivalent contents: (a) Orientation and Mobility; (b) Introduction of Visual Impairments; (c) Braille and Visual Aids; (d) Ophthalmology; and (e) Teaching Methods for Students with Visual Impairments.

Survey responses. SI#13 was designed to explore the respondents’ professional capacity in education for the visually impaired, general concepts of special education, and knowledge of other disability categories. Appendix I lists all 50 content courses and teachers’ responses of courses that had been taken before. The appendix also shows the results of analysis by teaching assignment discussed earlier in SI#2.

All 76 participants responded to the item. As shown in Appendix I, The six most frequently taken courses include the following: (a) Introduction to Exceptional Children (n = 75, 98.68% of 76 respondents); (b) Orientation and Mobility (n = 72, 94.74%); (c) Behavioral Changing Strategies (n = 70, 92.11%); (d) Practicum in Special Education Classrooms (n = 69, 90.79%); (e) Rationales and Practices of Individualized Education Program (n = 67, 88.16); and (f) Ophthalmology” (n = 67, 88.16%).
“Introduction to Exceptional Children” received the highest score in the general special education courses, “Behavioral Changing Strategies” received the highest score in the elective courses, and “Orientation and Mobility” in the vision required courses. Of all the 50 courses, “Teaching Methods of Early Special Education” was the least mentioned course (only 6 teachers or 7.89% of 76 respondents), followed by “Basic Sign Language” (10 teachers or 13.16%), “Sex Education for Students with Special Needs” (13 teachers or 17.11%), and “Special Education Environmental Design” (10 teachers or 13.16%).

Thirty-six or 47.37% of respondents completed all ten required courses and 58 or 76.32% of respondents took 2 or more courses from the four suggested elective courses. Thirty teachers (39.47% of 76 respondents) fulfilled all of the required courses and the minimum numbers (at least two of the four) of the suggested elective courses.

The twenty most frequently completed content courses that the respondents reported by their teaching assignments are listed in Table 4.14. Twelve of 14 required or suggested elective content courses are listed by all teachers’ responses. “Contemporary Issues and Trends in Special Education” and “Parent-Teacher Collaboration and Family Supporting System” were not included in the twenty courses.

Nineteen respondents with residential school teaching assignments showed the four highest scored courses in “Practicum in Special Education Classrooms” (n = 19), “Introduction to Exceptional Children” (n = 18), “Behavioral Changing Strategies” (n = 18), and “Educational Assessment of Exceptional Learners” (n = 17). In terms of the five vision required courses, while “Orientation and Mobility” was reported by 16 of the 19 residential school teachers as the highest responded course, “Braille and Visual Aids” and “Teaching Methods for Students with Visual Impairments” were the least mentioned
<table>
<thead>
<tr>
<th>Course Name</th>
<th>All Respondents (total = 76)</th>
<th>Residential School (total = 19)</th>
<th>Resource Rooms (total = 12)</th>
<th>Itinerant Programs (total = 51)</th>
<th>Consultation (total = 13)</th>
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<tbody>
<tr>
<td></td>
<td>O</td>
<td>n</td>
<td>%</td>
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<td>13-01</td>
<td>Introduction to Exceptional Children</td>
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<td>7</td>
<td>64</td>
<td>84.21</td>
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</table>

*Order

Table 4.14: Teachers’ twenty highly scored courses (SI#13) (Continued).
Table 4.14 Cont’d

<table>
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<tr>
<th>13-24</th>
<th>Teaching Methods for Students with Visual Impairments</th>
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<th>64</th>
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<td>Educational Assessment of Exceptional Learners</td>
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<td>17</td>
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<td>Braille and Visual Aids</td>
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<td>Introduction to Mental Retardation</td>
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<td>Technological Implementation in Special Education</td>
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<td>13-38</td>
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Table 4.14 Cont’d

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<td>Speech-Language Development and Remediation</td>
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<tr>
<td>Training of Daily Living Skills</td>
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<tr>
<td></td>
<td>46.15</td>
<td>53.85</td>
</tr>
</tbody>
</table>

Note: 1. Bolded descriptions are required courses for all general special educators.
2. Italicized courses are in the set of four courses from which teachers are to select any two. Two courses in the set were not listed in the twenty most frequently completed courses.
3. Underlined descriptions are required courses for vision teachers.
(14 teachers each). Ten or 52.63% of the 19 residential school teachers completed all ten required courses and 15 or 78.95% of the respondents took 2 or more courses from the four suggested elective courses. Eight or 42.11% of 19 respondents fulfilled all of the required courses and the minimum numbers (at least two of the four) of the suggested elective courses.

Twelve teachers with resource room teaching assignments responded to the item. They all reported having taken the following five courses: “Introduction to Exceptional Children,” “Practicum in Special Education Classrooms,” “Rationales and Practice of Individualized Education Program,” “Teaching Methods for Students with Disabilities,” and “Behavioral Changing Strategies.” “Orientation and Mobility” was the highest scored vision-related course (n = 11) and “Braille and Visual Aids” was the least reported course (n = 8, 66.67% of all 12 respondents) among the five vision courses. Six or 50% of the resource room teachers completed all ten required courses and 10 or 83.33% of the resource room teachers took 2 or more courses from the four suggested elective courses. Six or 50% of the resource room teachers completed all ten required courses and 10 or 83.33% of the resource room teachers took 2 or more courses from the four suggested elective courses. Five or 41.67% of the 12 resource room teachers fulfilled all of the required courses and the minimum numbers (at least two of the four) of the suggested elective courses.

Fifty-one teachers with itinerant program teaching assignments responded to SI#13. The following five courses were reported by the greatest numbers of respondents: “Introduction to Exceptional Children” (n = 51, 100% of 51 respondents), “Orientation and Mobility” (n = 51), “Ophthalmology” (n = 48, 94.12%), “Behavioral Changing
Strategies” (n = 45, 88.24%), and “Practicum in Special Education Classrooms” (n = 44, 86.27%). “Orientation and Mobility” was the highest scored course by the 51 itinerant teachers, and “Braille and Visual Aids” was the least mentioned (n = 42, 82.35%) in the five vision courses. Twenty-four or 47.06% of the 51 itinerant teachers completed all ten required courses and 37 or 72.55% of the itinerant teachers took 2 or more courses from the four suggested elective courses. Nineteen or 37.25% of the itinerant teachers fulfilled all of the required courses and the minimum numbers (at least two of the four) of the suggested elective courses.

Thirteen teachers who indicated providing consultation services responded to the item. The six highest scored courses were: “Introduction to Exceptional Children” (n = 13, 100% of 13 respondents), “Behavioral Changing Strategies” (n = 13), “Orientation and Mobility” (n = 13), “Introduction of Visual Impairments” (n = 12), “Ophthalmology” (n = 12), and “Teaching Methods for Students with Visual Impairments” (n = 12). “Orientation and Mobility” was the most frequently indicated course among five vision required courses and “Braille and Visual Aids” (n = 9) was the least reported. Five or 38.46% of the 13 teachers providing consultation services completed all ten required courses and 11 or 84.62% of the 13 respondents took 2 or more courses from the four suggested elective courses. Five or 38.46% of the 13 respondents fulfilled all of the required courses and the minimum numbers (at least two of the four) of the suggested elective courses.
<table>
<thead>
<tr>
<th>Type of Certificate</th>
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<tr>
<td>General Special Education</td>
<td>15</td>
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<tr>
<td>Ed. for the Gifted and Talented</td>
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<tr>
<td>General Early Childhood Education</td>
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<tr>
<td>Ed. for the Mentally Retarded</td>
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<tr>
<td>Orientation and Mobility</td>
<td>2</td>
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<tr>
<td>Chinese</td>
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<tr>
<td>English</td>
<td>1</td>
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<tr>
<td>Geography</td>
<td>1</td>
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<td>Health</td>
<td>1</td>
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<tr>
<td>Consultation</td>
<td>1</td>
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<tr>
<td>Business</td>
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</tr>
<tr>
<td>One other certificate besides vision</td>
<td>23</td>
</tr>
<tr>
<td>Two other certificates besides vision</td>
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<td>Total Number of Respondent</td>
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<td>No Response</td>
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Table 4.15: Certified vision teachers’ additional certificates (SI#1).
SI#1, designed to explore respondents’ teaching certificate status, also provided information to understand the respondents’ complete proficiency in education. Forty-one of 76 teachers reported having other teaching certificates. Among the 41 respondents, 23 indicated that they had one other teaching certificate and 16 respondents reported two additional certificates (Table 4.15).

Twenty-six of 41 respondents (63.41%) indicated that they had the certificate to teach in general elementary classes, 15 teachers (36.59%) had certificates to teach in general special education classrooms, and 6 teachers (14.63%) had certificates to teach gifted and talented students. Only 3 of 41 teachers (7.32%) had certificates to teach in general early childhood classes.

More descriptive data were obtained from the interviews in which the participants elaborated their educational information and complete teaching experiences. All eighteen interview participants had a college or higher education degree from academic institutions with teacher preparation programs or special education-related programs in general universities. At the time the interviews were conducted, one teacher had a doctoral degree, two had master’s degrees, and two were in graduate programs.

**Summary**

All the 76 vision teachers in this study had a bachelor’s or higher degree and had completed course credit hours in general special education and vision. Almost 40% of the respondents had finished the minimum numbers of required and suggested elective courses for vision teachers’ teaching certificate. In addition to the required courses, many participants had taken courses in mental retardation and learning disabilities. More than
90% of the participants (n = 69) had taken braille courses at the time of this study. When asked about their own braille competency, the respondents generally reported having more competence to teach the literary braille code rather than the Nemeth braille code. Teachers also expressed confidence in their skills to make decisions regarding the selection of a reading medium for their students with severely limited vision.
RQ2: What Are The Differences and Similarities in Availability of Instructional Resources for Teachers in Different Educational Environments?

When the interview participants were asked to specify any support that were crucial to their braille teaching, comments were made about acquiring instructional resources from the local governmental department, community, schools, and students’ parents.

**Governmental Sources**

To obtain resources and support from the local department of special education, itinerant Teachers C and F had distinctly different experiences. Teacher C frequently failed to get the department’s financial support to hold education workshops related to visual impairment or to participate in professional conferences, while Teacher F in another city/county usually got positive responses from his department if the activity proposals were meaningful and achievable. Teacher F indicated: “It may be because of the superintendent’s special attention in the field of work and, most likely, the public recognition of the program that is earned from our persistent and hard work for many years” (Teacher F, 06/12/2006). He added that the close physical proximity of the department to the program increases the visibility of the program. Teacher J had similar comments to explain her program’s favorable relationship with the department of special education.
Community and School Support

Because students’ individual learning abilities vary by case, Teacher P indicated that teaching materials for the visually impaired are frequently designed and made by teachers for their particular students. In her special/residential school, she said, teaching materials made by teachers or adapted from purchased commercial products were usually filed for exchanging with other teachers. Teacher P, who was interviewed with Teacher Q, added, “Even though these teacher-made materials may not be as beautiful, sophisticated, and durable as the commercially made ones, they are cheap, flexible, disposable, and designed to meet students’ particular needs” (Teacher Q, 04/17/2006).

Teacher M, in a different school setting, also addressed special school resources for students, teachers, and parents:

As far as braille teaching materials, in addition to learning sheets that are designed by each teacher, we have a braille publication center here to help us make long or bulky braille printouts. We also have our own recording studio for making audio materials or duplication tasks. Our library also has pretty good quality of service. The librarian periodically posts the new book list on the bulletin board in the hallway and students’ parents are strongly encouraged to check them out. Besides, our braille publication center has the programming technology to make print/braille reading materials and they usually help the library transcribe the incoming regular print books into the braille/print format. (Teacher M, 06/13/2006)

Even with the abundant resources in the residential school, Teacher O indicated that sometimes teachers did not have required materials or tools, or they simply did not have time to make them; therefore, “we had our ideas or sketches of designs ready and asked for help from students’ parents, local stores, companies, or related agencies.” (Teacher O, 05/09/2006)
The situation is different for itinerant and resource room teachers. Most itinerant teachers and resource room teachers reported asking for help from students’ parents and for community support. Teacher R said:

There still are many people in the community who love to help if you ask. No matter how much they can do, these are precious resources to us … the most important consideration is: Education can’t wait! Children’s learning can’t wait until all of the regulations, facility constructions, equipment, and devices are ready … you have students come in anytime, and their learning develops in critical periods. (Teacher R, 05/16/2006)

Of all the community resources that itinerant teachers use to promote students’ braille abilities, the participants (Teachers A, C, F, G and J) most frequently mentioned the public or non-profit private libraries in the local areas or other cities/counties. The Branch Library for the blind (Chīmíng) of the Taipei Public Library System was particularly noted by Teachers A, F, and G as a significant learning resource because of the large collection of children’s books, their easy online check-out service, and free book home-delivery nationally.

_Parental Involvement in School_

Teacher P said that having a cooperative parent depends on “the teacher’s luck” (Teacher P, 05/09/2006). Teachers E, G, and K also indicated that only very few parents would automatically express their wish to help children learn. Teacher G said, “Only those who contacted me regularly were more willing to cooperate with me” (Teacher G, 05/04/2006). For those few parents with positive attitudes about their children’s
schooling, Teachers M and J said that some parents (mostly mothers) sacrificed their careers and entire lives so that they could concentrate on working closely with their children and the teachers in class and at home.

Specifically, as for braille learning, most of the participants stated that their hope for parents’ involvement in their young children’s literacy development is actively engaging the learning of braille reading and writing and are able to teach basic braille skills. If the parent knows the knowledge of braille reading and writing and be able to teach the literacy skills, he or she can continue the child’s braille learning at home to develop the child a generalization of braille literacy skills in different situations. In fact, all of the participants in the interviews reported that they invited the beginning braille learners’ parents or guardians to come to class to learn braille with their children, at least in the beginning stages. Teacher G said:

“It’s very important if we have the parent here with the small child in the beginning. Because the young child may be afraid of being alone with the new strange teacher, the child may possibly cry throughout the whole course or the whole day. Thus, all learning becomes impossible, not to mention braille instruction … Therefore, if the parent is here with the child, I can teach the parent first and then he or she can teach the child later on at home. (Teacher G, 05/04/2006)

Teacher B also indicated:

I felt stressed when parents started to sit in the class with us because they raised a lot of questions, stare at me and listen to my every word in the class … In spite of that, I still feel their personal involvement in this is very important … It is a must-do. (Teacher B, 05/26/2006)
She continued commenting on one parent’s case:

Because of the parent’s full participation in my braille instruction, now she can help a great deal with her child’s school work which, exactly, releases a huge workload off of me … it also has to do with the parent’s attitude toward teachers. She tried hard not to bother teachers in the off-work time … she was pretty understanding and considerate. (Teacher B, 05/26/2006)

Teacher N also had a very devoted grandma in her class:

She learned braille with her granddaughter from the very beginning. It turned out that now she can give the regular class teacher a very big hand. For example, in math class, there are solid geometry questions, right? The grandma helped the teacher make tangible teaching materials with resin, string, wood, or something. She also helped to type braille exam sheets. (Teacher N, 05/17/2006)

Teacher A indicated that students’ braille learning outcomes vary by ways of the parents’ engagement in the braille course:

In the beginning, the mom came to learn braille with her child … they learned together and I didn’t have to take time teaching the mom again. We discussed any questions and solved them right away … but months later, the mom went to work, and I only met her when she came to pick up her child. I could only tell her what was learned that day and the assignment to practice at home. (Teacher A, 05/10/2006)

She continued:

And then I did find differences there. When the mom was co-learning with the child in the class, she would use my ways to teach the child at home. But if she only had my brief verbal instruction and did not have the situational concepts of the child’s initial learning experience, she would use her own ways to teach the child at home. The child’s learning outcomes turned out to be a little bit askew. (Teacher A, 05/10/2006)

In addition to linking school learning experiences with after-class practices at home, Teacher M said parents’ participating in children’s braille class also helps the braille teacher distribute some teaching responsibilities to parents. This sharing of responsibilities can also increase the parents’ sense of partnership with the teacher and their sense of being a significant member of the student’s school team. For example,
Teacher M indicated that she taught students’ parents the accurate brailler operation skills (e.g. putting braille paper into the brailler, skills of paper alignment or proper hand, arm and torso positions) so that parents could be in charge of teaching that task at home.

Teachers A, G, and N had similar thoughts that incorporating children’s learning experiences at home, such as listening to the commercially made pronunciation practice tapes or playing with fine motor training toys, can make the formal instruction of braille spelling and writing much easier.

While teachers found that parental involvement in children’s education is generally desirable, Teacher E described one totally blind student’s mother who was strictly academically oriented:

> Once the student scored 97 points on his natural sciences midterm exam. I said: ‘What an outstanding score you’ve got!’ But he replied, ‘I’m dead now with that score! My mom will condemn me to hell!!’ Hello? My daughter of his same grade always got 70 or 80 points on that subject and now he worries about being condemned for missing 3 points?… This mom has a very high academic expectation of her son and she always thinks, ‘Even though my son is blind, he is not less capable than other typically normal students in anything!’ (Teacher E, 05/24/2006)

Most participants in interviews agreed that parents’ attitudes and manners are closely tied to young students’ learning outcomes. Teacher P said, “Some parents have guilty and compensative feelings about the child’s vision conditions … Therefore, they may be rather permissive regarding the child’s education and not want to force the child into any unwanted situation” (Teacher P, 05/09/2006). Teacher M also pointed out that signs of parents’ overprotection are commonly seen on students’ performance in class. The bad influences obviously appeared as “students’ poor sense of learning responsibility and
lacking independent problem-solving skills” (Teacher M, 06/13/2006). Teacher E illustrated parents’ reluctance to accept the child’s disability status that really had an impact on making appropriate placement decisions and timely educational intervention:

Once I tried to discuss the young guy’s placement with the mom. She told me, ‘Now I’m giving him some amazing supplementary diet that people said can improve his vision acuity.’ She still believed that her child’s ‘visual potential’ could be exploited, and the current conditions were just temporary. And if you still want to talk to her about the new placement, she’d start to change her friendly face. (Teacher E, 05/24/2006)

Teachers identified various reasons that contribute to parents’ paying less attention to their children’s school work or passively engaging in children’s learning activities. First of all, parents may lack information or enough knowledge about what they should do to help their children. For example, Teacher O said, the parents did take the child to the vocational therapist. However, when Teacher O asked the parents if they helped the child to practice what they had learned from the therapist at home, the parents surprisingly asked, “Huh?? We have to practice at home?” (Teacher O, 05/09/2006). To make sure that parents have basic concepts and knowledge to help their children efficiently, Teacher G said:

Usually I have a conversation with the new student’s parents to understand what they need or tell them what I’m going to tell them. Then I will give them some related books or documents that they can read. Sometimes when they come to class with the child, I can also make good use of the time to clarify some thoughts with them. Additionally, I will give them helpful information, such as parental associations for the children with visual impairment or related foundations or agencies, and I’ll explain structures and functions of those organizations to them. (Teacher G, 05/04/2006)

For parents who did not know much about children’s schooling or could not engage in students’ learning activities, Teachers E and K pointed out that usually they
were “very polite” and “thankful” to teachers for “being willing to take care of their children” and they “heavily relied on school teachers’ evaluation and judgments for their children’s education.” But, for example, when Teacher E invited a parent to come and learn braille with her child, “she always said that she was very busy” (Teacher E, 05/24/2006) and refused to read the books that Teacher E wanted to give her.

Teachers indicated reasons why some parents may not seem to cooperate with schools as much as the teachers would like. Low socioeconomic status of the student’s family may be to blame for parents’/guardians’ passive attitudes or ignoring the importance of education (Teachers E, F and N). Other possible explanations may include “too many siblings” (Teacher F), “busy working mother” (Teacher F), “busy family business” (Teacher N), or “under relatives’ guardianship” (Teacher E). However, “no expectations for the child” may be one of the most significant reasons to explain parents’ attitudes regarding their children’s education. Teacher K said:

Students’ living in the dormitory of the residential school rather than at home may be one of the reasons that parents lose connection with their children’s education. However, the truth is, most parents primarily care about whether there is a school for their children to attend. [They are so desperate to place their disabled child in a school that their child’s] doing well or not in learning is a secondary concern to them. If they had a higher expectation for their children, probably they would pay much more attention to their children’s braille performance. (Teacher K, 05/16/2006)

According to Teacher N, parents’ carelessness about children’s education may show in the children’s frequently missing school and turning in late assignments. Teacher B also said that parents “frequently forgot teachers’ requests” (Teacher B, 05/26/2006).
Summary

The interview participants obtained instructional support from government, community, schools, and students’ parents to practice braille teaching. For itinerant vision teachers in Taiwan, since their main financial sources are directly from the local government offices, they have to send applications to get special funding if a considerable amount of money is needed for some special events, such as holding instructional workshops for the teachers in the program, attending professional conferences, or purchasing an expensive light box, for example, for young visually impaired students. Not all applications for money are approved. Teachers interviewed stated that the district superintendent’s special interest in the field of vision, the close physical proximity of the department office to the itinerant program, and the vision teacher’s positive relationship with the official personnel may increase the chances of getting a funding application accepted by the department.

Most residential school teachers who were interviewed appreciated the richness and availability of teaching materials that they could obtain in their schools. Occasionally, however, teachers in residential schools still needed to resort to help from the local community, such as retail stores, companies, and concerned agencies or organizations. For the itinerant teachers working alone with students’ braille learning with a strictly limited budget, the local community groups comprised the main supporting resource.

The Branch Library for the Blind (Chǐmíng) of the Taipei Public Library System features a large collection of children’s books, easy online check-out service and free book home-delivery nationally. It has become one of itinerant vision teachers’ favorite
resources. As a matter of fact, some residential school teachers also suggested that their students check out books from the diverse collection of the Branch Library for the Blind (Chǐmìng) of the Taipei Public Library System.

The teachers reiterated that parental involvement in students’ school learning as a significant resource to vision teachers’ instruction was important especially to young students’ braille learning. In the interviews, several participants in residential schools and itinerant programs also clearly pointed out that having an understanding and devoted parent is a special blessing. Parents’ various attitudes toward students’ braille learning ranged from maximum control of full-time attention and involvement in the child’s entire school work to co-learning braille with students, supervising students’ braille homework, appreciating vision teachers’ work but not being involved in the child’s class learning, to frequently ignoring or never responding to teachers’ requests.
RQ3: What Are The Approaches or Techniques Used by Teachers to Implement Braille Literacy Practices?

This research question is answered by the interview participants’ descriptions of their braille instruction for students in kindergarten, first-, and second grades, or students whose blindness developed at an older grade level. The interview participants’ experiences and reflections are summarized in the following three sections that are discussed below: Braille Instruction Procedures, Early Formal Braille Instruction, and Beginning Formal Braille Instruction. The first section includes some participants’ experiences of braille instruction procedures. The second and third sections illustrate the participants’ opinions about pre-requisite skills, curriculum design, teaching strategies to encourage students’ braille learning motivation at various levels, and learning outcome assessments.

Braille Instruction Procedures

When the investigator asked the participants whether they had specific instructional procedures to lead a braille novice to the formal learning stage, five teachers (F, H, M, N, and S) shared their rationales for (pre-)braille teaching and curriculum arrangements. For example, when the investigator mentioned that the auditory questions in the inventory may be too detailed for some teachers, Teacher N replied immediately:

Not at all! See? If you don’t listen well, you don’t speak well; if you don’t speak well, you don’t know the accurate sound elements of a word. If you don’t know the basic phonetic structure of a word, how can you learn braille? Generating the accurate pronunciation of braille symbols of a Chinese character is the most important part of Chinese braille learning. (Teacher N, 05/17/2006)
Teacher L also pointed out that braille instruction for students with cognitive problems in learning needs to be more specific and strategic than for those with only visual impairments. She explained her teaching procedure:

In the beginning … one should have numerical concepts ... be able to count 1-2-3-4-5-6 ... then the student should understand the idea of object display patterns; specifically, two columns by three rows. And then the student should have the spatial sense of the six numerical positions on a braille cell … After that, the student should understand that each shape of braille cell has an unchangeable designated name. (Teacher L, 05/09/2006)

Residential school Teacher M had many successful experiences teaching braille to students with other disabilities. She provided her insights for braille teaching and learning in the early stages:

If the student didn’t have the basic concept of language connection, nor well developed gross motor or fine motor skills, what you need to do is start the training from the very beginning … from body stretch in gross motor to pick and hold objects in fine motor, and then move to basic language comprehension and expression …. For young students … braille is not an easy task to learn because it requires tactile sensibility and discrimination, as well as cognitive integration skills. (Teacher M, 06/13/2006)

Early Formal Braille Instruction

Pre-requisite skills. The majority of interview participants with teaching experiences with young students had only one year of kindergarten to teach both pre-braille and early formal braille skills to the students. The pre-braille stage is usually a brief measuring phase of basic and functional skills for literacy. In most cases, however, the participants blended those probing and training strategies into early formal braille instruction. Therefore, in the current study, it is difficult to identify the boundary between the stages of pre-braille and early formal braille teaching and learning. The analysis in this section covers (pre-)braille instruction in both stages.
Some participants who had taught young children or beginning braille learners provided information about pre-requisite skills for braille literacy by itemizing teaching tasks in two or three words, while others illustrated a series of braille training procedures in some hundred words. As Teacher M pointed out above, learning braille is a sophisticated task that requires a variety of concepts to be developed before the actual engagement. The participants’ responses to the pre-requisite skills for braille can be summarized as follows: orientation, motor, auditory, and cognitive skills.

First, the participants brought up orientation skills from the perspectives of directionality (Teachers C, F, G, H, I, O, and Q), spatial perception (Teachers H, I, N, and P) and body sense (Teacher S). Second, motor movement was indicated by gross motor and tactile sensitivity. Teachers B and M pointed out that arm movement is the foundation of fine motor development. Seven teachers (A, C, G, H, N, O, and Q) emphasized the importance of tactile sensitivities that require various textural stimuli to enhance tactile tracking, sorting, and discriminating skills. Third, auditory skills that the participants identified included general auditory information, environmental sounds, and human voice. With regard to auditory skills, what the participants were concerned about the most was memorizing auditory information (Teachers G, H, I, and O), distinguishing human pronunciation (Teachers I and N), and detecting sound sources and types (Teachers A, G, H, and M). Lastly, cognitive abilities identified for pre-braille learning included object existence (N), memory skills (Teachers D, H, I, and N), counting and matching skills (Teachers H, I, and N), and verbal language comprehension and expression ( Teachers A, D, G, and N).
In addition to the general pre-requisite skills for braille learning, the participants emphasized that, if possible, braille students must learn Zhùyīn fūhào (the sound-annotating transcription system) and Zhùyīn braille symbols before they enter elementary school. Itinerant Teacher A said, “In the regular school, everyone has to learn Zhùyīn fūhào in the first ten weeks of the first grade. After that, the following lessons will move to assembling and writing Zhùyīn fūhào for characters” (Teacher A, 05/10/2006). Most sighted students go to kindergarten and learn Zhùyīn fūhào before the formal teaching in elementary school. For the typical student, the first ten weeks of the first grade are usually spent reviewing Zhùyīn fūhào. However, not all children with visual impairment attend kindergarten and may miss out on learning Zhùyīn fūhào and basic cell structures of Zhùyīn braille symbols. Teacher A commented:

If our students never learn Zhùyīn braille or the concepts of Zhùyīn fūhào until entering elementary school [, which is very possible], then in 10 weeks the student has to learn symbolic pronunciation, the braille structure, and writing from the very beginning. So s/he definitely falls behind his/her sighted classmates. (Teacher A, 05/10/2006)

Teacher R remarked that a young visually impaired student also needs extra time in the first grade to physically and psychologically get accustomed to a new environment. She said:

For a typical sighted student [who has never been exposed to Zhùyīn fūhào before], it’s still too short to learn it in 10 weeks. For a student who is a beginning Zhùyīn braille learner … in the same period … [, surely it is impossible,] unless the student has a pretty high function of academic learning skills. (Teacher R, 05/16/2006)

This is why Teachers A and P said, when they had a new braille student attending the school who never had braille learning experiences, they always felt greatly stressed, worrying about the student’s learning progress.
Curriculum design and instructional strategy. Since young students’ learning requires a close connection between concept development and related concrete experience, Teachers I and P emphasized that when designing a braille reading and writing curriculum, it is especially important for the teacher to integrate children’s learned knowledge and their everyday experiences in their environment. Teachers A, G, M, and N also pointed out that braille learning is “not fun,” especially for young children who have a shorter attention span and limited physical or cognitive capacity. Therefore, young children definitely need to be motivated to learn braille to promote their learning and efficiency.

Among various instructional strategies to enhance young children’s interest in learning, the participants stressed the importance of playful and meaningful feelings toward learning content. Teachers A, G, N, O, and Q reported that make-up stories or thematic contexts were efficient because a living and imaginative context is “naturally” created that makes braille learning not too “dry” and “boring” to young students. For example, Teacher A used pictorial descriptions to illustrate different tactile sequences on pre-braille training tasks for the student, such as “finding the stone on the road” (::{: :::: :,:), “finding the heartbeat” (::{: :}:{: :} :,:), or “climbing the stairs” (::{: :::: :}). Teacher N also made up the story context of six tadpoles living in a three-floor twin apartment. With a visually impaired student with mild mental retardation, Teacher D used his nickname as the character’s name in make-up stories, which usually cheered up the student and captured his attention for a while. As Teacher P said, teachers have to use every method, sometimes silly approaches, in order to draw young students’
attention and interest into the learning contents. Similarly, Teacher N gave an example of when she taught students how to remember cell structures and matching names:

I tell students, ‘when people ask you ‘Do you know it?’ (Zhùyīn symbols are: 阻 ㄔㄨˊ), you’ll nod your head once if you do know it, right? So, dot 1 ( ) is 阻 (know). When you are eating (eat, the Zhùyīn symbol is ㄔ) your lunch, how many hands do you use? Two, right? So, dots 1-2 ( b) is ㄔ’… Once a student did say: ‘But I only need one hand to hold my spoon!’ I replied, ‘Don’t you need another hand to hold your bowl?’ (Teacher N, 05/17/2006)

In addition to connecting meaningful activities and thematic contexts with students’ daily experiences, Teachers A, D, G, K, and O also reported that using genuine objects and manipulable devices help young students establish a solid concept and then extend their knowledge of the (pre-)braille skill. For example, when developing the idea of a round shape for a student, Teacher D used an orange to introduce the concepts of size, periphery, texture, and smell. And then he presented other fruits for the student to make a comparison. As a congenitally blind individual himself, he particularly emphasized that early literacy concepts should be developed with tangible objects for a visually impaired child.

Nursery rhymes and songs have been identified as favorite elements in young children’s school lives. The residential school Teacher K accompanied braille nursery rhymes with percussion instruments for the beginning (or pre-)braille learner. Teacher N also wrote braille nursery songs for the class to practice during their daily music period.

Learning outcome assessment. As mentioned above, pre-braille skills are a series of basic physical capabilities and cognitive skills, and the participants indicated that
opportunities to learn these capabilities and skills should be embedded within young students’ daily living skills. Therefore, students’ pre-braille learning efficiency primarily relies on their teachers’ close observation and probing strategies.

Teacher M said, because some students were unable to take functional skill tests, a teacher could only evaluate their basic development by drawing on her accumulated teaching experience and careful observations. Rather than evaluating students’ individual skill development, Teacher N made or modified commercial products for students to practice, such as tracking games on embossed mazes, tangible Monopoly, and braille Tic-Tac-Toe, so that she could check up on students’ comprehension and integration skills while the student was actively engaged with the materials. She also designed game-like braille working sheets to look at students’ completed tasks. As she said, “I’m making every effort to make them learn braille through playful activities.”

**Beginning Formal Braille Instruction**

*Pre-requisite skills.* Teacher D mentioned the importance of concrete learning experiences in the earlier stages of learning braille. A similar approach also applies to older student’s advanced literacy skill development. Teacher R explained:

> When we are teaching … especially to the first or second grade students … because they are on Piaget’s developmental stage of concrete operation, our intervention approaches should be solid, living experience-bonded with manipulable objects—that is, concepts of nouns should be taught before verbs. (Teacher R, 05/16/2006)

After a student had learned the Zhùyīn symbol’s pronunciation and its matching braille structure, Teacher N indicated that assembling the accurate braille symbols for a Chinese character becomes a critical task for the student’s future development of Chinese
braille literacy skills. Likewise, as Teacher G simply said, “The end goal of Zhùyīn braille instruction is to assemble the precise sound of a Chinese character” (Teacher G, 05/04/2006).

In fact, to establish students’ skills to assemble the phonetic elements of a Chinese character meaningfully in the early formal braille learning stage, some respondents (Teachers A, G, and O) integrated the concept of assembling phonetic elements into the single Chinese Zhùyīn braille symbol learning activity. For example, when teaching the concept of [pʰ], Teacher A told a young student: “The [pʰ] is the beginning sound of [pʰŋ kuo˨˩˦] (apple)” (Teacher A, 05/10/2006).

Teachers A, D, G, J, and R suggested that young students would be more involved in verbal phonetic assembling activities if they had learned common consonants and vowels first to assemble the phonetic elements of their favorite objects, places, and significant people’s names. Then new concepts of phonetic elements might be more easily developed by the same instruction pattern. For example, Teacher D said, if the student only learned the consonants [m], [k], [tʂ] and the vowels [aʊ], [ɔ], he still can assemble understandable words like [maʊ˥˥˥] (“cat”), [kaʊ˥˥˥] (“cake”), [kou˥˥˥] (“gutter”), [tʂou˥˥˥] (“rice soup”) or [kə˥˥˥] (“brother”). If concepts of tones [˥], [˧˥], [˨˩˦], [˥˩] and of
the light tone) are also learned and added to the known words, such as ጗xmm (“fur”) and እኔ (“hat”), the student’s word bank will be gradually extended.

Although Zhùyīn tonal concepts can be introduced through different lesson activities, the very similar strategies that Teachers L, M, and N implemented were exaggerated motion presentation and repeated verbal practice. For instance, residential school Teacher N illustrated the context she created for young students to understand the characteristics of each Zhùyīn tone. She told students:

The first tone (high level – [˥˥˥], ጗) is a lazy kid. He wants to do nothing but sit on the chair. He always talks like a robot. The second tone (high rising – [˧˥], ጗) likes to play with flying stuff. He always jumps up to catch butterflies. The third tone (low dipping – [˨˩˦], ጇ) likes to pretend being a spring. He likes to stand up, bend his knees and stand up over and over again. The game makes him just look like an “up-down-up-down” spring. The fourth tone (high falling – [˥˩], ጗) is hot tempered and always gets angry about everything. When he is not happy, he always stomps heavily on the floor. The slight tone (∙) is a little shy kid and always speaks like s/he is whispering to you. (Teacher N, 05/17/2006)

After providing the context information to students, Teacher N would call out a Chinese character and ask students to answer which tone the character represents by way of acting out the matching tone’s motion. For example, when Teacher N said [wən˥] (✘ እ, in the first tone of the high level, usually the tone symbol is omitted in the writing), and the students should sit on chairs. When Teacher N said [wən˦] (✘ እ, in the second tone of the high rising level), the students should jump up high to show the rising position. This approach, Teacher N pointed out, not only helps a teacher to draw
students’ attention to the character’s pronunciation and motivate students to be actively engaged in class activities, but also presents direct evidence for the teacher to understand the students’ learning outcomes.

For the older students who are beginning braille learners, Teacher K described how he used occasions in daily life to reinforce students’ abilities to distinguish those tones:

In my opinion, you don’t have to stay in class to learn those tones. Like … when walking in the hallway, students usually track their walking line by brushing their hand along the wall. If I am walking with them, sometimes I may prompt them: ‘How do you say [tɕiaŋ˥ bi˥] (wall) in four different tones?’ Then they would reply: ‘[tɕiaŋ˥], [tɕiaŋ˩], [tɕiaŋ˨˩˦], [tɕiaŋ˥˩]’ and ‘[bi˥], [bi˩], [bi˨˩˦], [bi˥˩]’ to me. Or, sometimes I may play the piano to them in four different tone pitches and ask them to tell me what sounds they’ve heard: ‘[diŋ˥˥˥], [diŋ˧˥], [diŋ˨˩˦], [diŋ˥˩]’ … just like that. After they are pretty familiar with the orders and patterns of the tones, I may prompt them: ‘How do you say [tɕiaŋ˥] in the third tone?’ Then they should tell me: [tɕiaŋ˨˩˦]. (Teacher K, 05/16/2006)

This section explored the participants’ curriculum design and instructional strategies about verbally assembling Chinese words phonetically. The following section addresses how the participants teach braille reading and writing to students in the beginning formal stages. Assessment of learning outcomes is also included at the end of the section.

Curriculum design and instructional strategies. Teachers G, N, O, and P indicated that once a student has learned the structure of each Zhùyīn braille symbol and skills of assembling Zhùyīn phonetic braille symbols in Chinese characters, s/he should establish basic braille reading skills before moving to actual braille writer practice.

Braille reading. When asked how reading instruction was designed and arranged for students in the beginning formal literacy stage, Teacher K said, firstly, one has to see
the students’ learning habits and attitudes. If the student has enough cognitive and learning ability, he or she is more possibly motivated to read and will love to read and read frequently. The more reading experience the student accumulates, the more refined reading skills he or she will build. “This motivation procedure creates a positive learning cycle” (Teacher K, 05/16/2006).

In addition to making the braille learning contents and contexts full of fun and match the student’s interest, some participants also took the students’ age-appropriate tendencies and behavior into consideration. For example, Teacher K said that the residential school regularly held class competitions on reading aloud, speech, composition, and speed braille reading. The younger students learning with the same-age peers particularly benefited from these preparations because they would practice more in order to compete with the other kids and “show off.” Similarly, Teacher R made pocket braille books for the young student to practice his/her reading skills. It is not uncommon for young students to have low self-confidence in braille learning. The booklet designed with few sentences of braille text on each page gave the young student confidence by making him/her think, “I can read a whole book!” (Teacher R, 05/16/2006).

In the three basic reading elements (consonants, vowels and tones) of each Chinese character, Teacher M taught students to first tactually read the vowel sound and the tone pitch aloud and then add the consonant sound into the whole character pronunciation. After the students’ braille reading skill of the single character improved, Teacher M asked students to assemble the phonetic elements in their minds and then directly read out the pronunciation of the Chinese character. A similar approach was also
reported by Teacher T. She furthered the approach for the advanced braille students by asking them to assemble the phonetic elements in their heads and read out the Chinese words with appropriate breaks between the words.

To establish students’ advanced Chinese braille word decoding skills, Teachers G and M emphasized the importance of frequent and considerable braille reading in the beginning formal braille stage. Teacher G said:

In fact, his tactile reading speed will influence his reading comprehension in two ways. First, if his reading speed is too slow, he may forget what’s been read a moment ago. Secondly, when he slowly reads a short paragraph word by word, he may read some adjunct Chinese characters altogether without any break; that is, he may make out a wrong Chinese word by pausing in the wrong place, and not be able to comprehend the meaning of the whole sentence … Therefore, in my opinion, to improve his reading comprehension, he should be skillful in braille symbol reading and associating the information with familiar concepts in his daily life. (Teacher G, 05/04/2006)

The investigator asked Teacher G to illustrate an instruction case:

If he assembled ickets ([kuoŋ˥˥˥]) in his head but didn’t know how to read it out altogether, I usually said, ‘Tell me what you’ve read.’ He said, ‘[k], [uoŋ], first tone.’ I asked, ‘How do you read it together?’ Then he would reply, [kuoŋ˥˥˥]. After that, he may not understand what this ickets meant in the text. So, I would ask him, ‘Read on.’ After he finished the whole sentence, probably he would realize by himself that ‘Oh~ that [kuoŋ˥˥˥]! The one that is used in [kuoŋ˥˩ʐən˦˦] (worker).” (Teacher G, 05/04/2006)

What Teacher G indicated in this case is that braille reading comprehension should be formed with skillful braille decoding ability joined with abundant concrete experiences. Similarly, Teacher R explained:

After consistent and frequent reading practice, a skillful student’s processing of braille reading is no longer counting the numerical position, nor specifically assembling the phonetic elements of each Chinese character. He simply comprehends the meaning of a sentence by sweeping over each braille shape and quickly identifying the meaning. (Teacher R, 05/16/2006)
Braille writing. Although the participants did not address motivating students’ braille writing practice much, Teachers A, G, and M mentioned that the completion of a braille writing task itself was a great achievement for the young student, and the students usually felt rewarded by reading over what they had completed. Teacher K also indicated that usually students were more responsive to different sound effects; therefore, when he designed the online braille writing lesson for the young student, he put various auditory feedbacks to “cheer on” the student, once the writing tasks were finished.

As mentioned above, some participants (Teachers G and N) asserted that braille students should not operate a braille writer until they have learned the basic concepts of the Zhùyīn braille system. In Teacher N’s opinion, in the beginning formal braille stage it is not as important to build up braille writing skills as it is to acquire braille reading skills. As she said,

The structures of Chinese characters are so complicated for the sighted student that the young student needs to learn print writing skills as early as possible. However, Zhùyīn braille system only has so many [64] configurations to remember. As long as you know braille structures and ways to assemble words, learning to use brailler is not a big deal. (Teacher N, 05/17/2006)

Teacher G had different reasons to delay students from learning to use a braille writer in the beginning stage. She said:

It is true that operating a brailler is far more interesting than braille reading. If you teach braille reading and writing at the same time, the student may be prone to brailler operation and pay less attention to learn braille reading skills. (Teacher G, 05/04/2006)
Another reason Teacher G gave for not starting brailer instruction early is related to a young student’s fine motor development. She said that usually the young student’s fourth finger needs more training before going to the braille writer. Otherwise, the student may use the fourth finger and the little finger to type only dot three or dot six.

Unlike the above teachers who postponed braille writing instruction in the early phase, Teachers A and N reported their braille students’ initial brailer lessons were as early as in their kindergarten classes and Teacher G, P, and Q reported offering brailer lessons in the first grade.

In the few interviews where teachers addressed braille writing in the beginning formal braille learning stages, three participants (Teachers L, M and T) mentioned instruction in the use of the slate and stylus. If the student had developed the pre-requisite skills well enough, Teachers K and M said that the student could start to learn slate and stylus in the first grade. Teacher M was convinced that young students did have the ability to write braille with the slate and stylus.

Learning outcome assessment. When asked about braille learning assessment in the beginning formal braille learning stages, itinerant Teachers A, G, and J said that students’ braille learning outcomes were primarily examined by the regular class lesson tests used for sighted students. The residential school Teacher M also evaluated the students’ braille reading and writing skills according to the typical students’ learning materials.

Teachers A and M remarked that speed and accuracy were two criteria to evaluate the student’s braille reading and writing skills. When Teacher A evaluated a student’s reading comprehension, she would ask the student to read an unfamiliar text so that she
could record the reading speed and reading errors per minute. Teachers G and R added that appropriate word breaking in the sentence reading was an important way to assess students’ reading errors. For example, Teacher R said:

If he has the texts in braille: ㄐㄢˋ ㄙ ㄕˊ ㄨ ㄭ ㄌ ㄨˊ ˊ ㄨ ㄐ ˋ ˊ, he is supposed to directly read out the words with proper short breaks between words: ‘[paip a tsai yi yen tsu li tsi hu tsua m],’ and then say period. (Daddy is weeding in the yard.) (Teacher R, 05/16/2006)

In terms of braille writing assessment, Teacher K said that there were two skills to assess: braille copying and listening to write. Braille copying skills involve tactual reading skills, memory, and braille writing skills. When doing the braille copying assessment, students are expected to read a short sentence with punctuation, pause to write, and then continue reading. Listening to write includes skills of meticulous listening skills, memory, and braille writing skills. Teacher K said that the assessment of listening to write is much more difficult than braille copying assessment.

While most assessments were designed for formal lesson processes, Teacher K introduced his website to students and encouraged them to write to the public which he saw as an alternative braille literacy assessment. He said:

In addition to verbal expression, I hope my students have literary expression skills. Even further, I want them to share their newly learned knowledge with others through literary form. And the best way to do it is by expressing their thoughts online in written language, specifically, in the form of written print, so that everybody can access the text and converse with the braille student. Through the student’s online written texts and communication records with others, I can also evaluate the student’s understanding of a concept. (Teacher K, 05/16/2006)

Summary

The investigator asked the interview participants: “How do you teach a young (or beginning braille) student to learn braille from the very beginning point to the formal
braille reading stage?” While some teachers simply itemized the braille pre-requisite skills of braille learning, others systematically illustrated their instruction with developmental procedures for those concepts and skills. To sum up, the interview participants’ responses to the investigator’s how question can be covered in the four general ability areas: orientation, motor, auditory, and cognitive skills. A majority of the interview participants also expected a braille student should, at least, develop the concepts of Zhùyīn fúhào as early as possible, because Chinese braille in Taiwan is based on the phonetic system of Zhùyīn fúhào, and most sighted children learn Zhùyīn fúhào early in kindergarten.

Most of the participants who had taught students younger than the age of the first grade had to teach both pre-braille and early braille skills in the last of the kindergarten year(s). (In Taiwan, a child can attend kindergarten for three years.) Therefore, teachers usually blended the instruction of pre-braille skills into early formal braille skill teaching. According to teachers’ responses, one who designs (pre)braille curriculum for students at this young age, first of all, must motivate students’ interest for learning. Playful, authentic, manipulable, and meaningful feelings toward learning contents were critical to draw young students’ attention and to extend their learning curiosity and interest. Since the curriculum is designed primarily based on students’ individual development, the assessment of young students’ (pre)braille learning efficiency greatly relies on teachers’ daily observations and evaluating strategies.

Teachers claimed that, if the student has learned Zhùyīn fúhào and the matched Zhùyīn braille to each phonetic element, the student can advance to the stage of beginning formal braille learning. The key learning tasks of this phase require one’s ability to
demonstrate solid concepts of Zhùyīn fúhào and to read and write texts in accurate Zhùyīn braille. At this stage, the braille student should be able to verbally assemble the accurate phonetic elements (including consonants, vowels and tones) of a specific Chinese character. Even though the Zhùyīn braille learning tasks are more structured and complicated, the instructional strategies of applying meaningful, concrete, and individual experience to the learning content still plays an important role in motivating students’ braille learning. The participants also depicted exaggerated body or verbal presentations and repeated text practice routines as ways to impress students and capture their attention.

As for learning braille reading and writing in the beginning formal braille stages, it seemed that the interview participants tended to indicate instruction in more reading techniques than the reading comprehension skills. This tendency is understandable because, in the beginning learning stages, a vision teacher usually prioritizes developing the student’s basic braille reading skills over other skills. The comprehension skills for braille reading materials include tactile reading techniques, cognitive skills for phonemic and word processing, and related experiences in the student’s daily life. Therefore, in addition to the vision teacher’s instruction, educational intervention from the student’s regular class teachers, parents, and other related personnel is also necessary.

Typically, a braille student’s reading speed is slower than that of his/her sighted peer. Given the braille student’s literacy proficiency in the inclusion settings, the participants were particularly concerned about their braille students’ reading and writing speed, as well as the reading and writing errors they made in a limited period of time. The participants indicated that if the braille student is studying in a regular school, usually the examinations go with the regular class subject tests. However, the participants in both
regular and residential schools pointed out that when the specific braille assessment was conducted individually, speed with accuracy was the criterion to evaluate the beginning braille student’s reading and writing skills. Particularly, a student who could fluently read aloud from new braille texts with appropriate breaks in sentences would indicate his/her advanced braille reading comprehension skills. The student’s quick and accurate completion of the tests of copying braille or listening to write in braille determined his/her proficiency in braille writing.
RQ4: What Are Teachers’ Concerns about Braille Instruction?

This question is answered by survey respondents’ attitudes concerning braille and braille instruction (SI#21 and SI#25); technology implementation (SI#22 and SI#27); the Nemeth code (SI#23); the braille refresher course (SI#24) and slate and stylus (SI#26). The response results are displayed in Table 4.16. A summary of the respondents’ attitudes toward each item description is provided in Table 4.17. SI#28 through SI#32 are designed to understand the respondents’ opinions toward other Braille-related issues: SI#28 - perceptions of other vision teachers’ braille proficiency; SI#29 - feelings about legislative authority involvement in instruction; SI#30 - attitudes about IEP’s efficiency; and SI#31 & SI#32 - feelings about braille progress in Taiwan. The response results are displayed in Table 4.18. A summary of the respondents’ attitudes toward each item description is provided in Table 4.19. The interview participants also discussed teaching braille literacy in the relationship between Braille and print, braille reading, instructional materials, and the implementation of technology.

Survey Responses

Seventy-five participants responded to SI#21 (I enjoy teaching braille), with a mean score of 3.64 on a 5-point Likert scale (standard deviation = 0.85) (Table 4.16). Forty-three respondents (57.33%) agreed or strongly agreed with the item description, twenty-seven teachers (36%) held a neutral attitude toward the description, and 5 teachers (6.67%) disagreed or strongly disagreed with the item description (Table 4.17).
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>SA</th>
<th>A</th>
<th>NEU</th>
<th>D</th>
<th>SD</th>
<th>n</th>
<th>M</th>
<th>Max</th>
<th>Min</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>I enjoy teaching braille.</td>
<td>11</td>
<td>32</td>
<td>27</td>
<td>4</td>
<td>1</td>
<td>75</td>
<td>3.64</td>
<td>5</td>
<td>1</td>
<td>0.85</td>
</tr>
<tr>
<td>22</td>
<td>Technological devices should be used to enhance braille, not replace it.</td>
<td>25</td>
<td>38</td>
<td>10</td>
<td>3</td>
<td>0</td>
<td>76</td>
<td>4.12</td>
<td>5</td>
<td>2</td>
<td>0.78</td>
</tr>
<tr>
<td>23</td>
<td>The Nemeth code is too complex and should not be taught.</td>
<td>0</td>
<td>2</td>
<td>27</td>
<td>30</td>
<td>16</td>
<td>75</td>
<td>2.20</td>
<td>4</td>
<td>1</td>
<td>0.81</td>
</tr>
<tr>
<td>24</td>
<td>Refresher training courses in braille should be required.</td>
<td>15</td>
<td>39</td>
<td>16</td>
<td>5</td>
<td>0</td>
<td>75</td>
<td>3.85</td>
<td>5</td>
<td>2</td>
<td>0.82</td>
</tr>
<tr>
<td>25</td>
<td>Braille is not an important learning medium.</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>37</td>
<td>33</td>
<td>76</td>
<td>1.64</td>
<td>3</td>
<td>1</td>
<td>0.63</td>
</tr>
<tr>
<td>26</td>
<td>In most cases, slate &amp; stylus should be taught to students who use braille.</td>
<td>14</td>
<td>32</td>
<td>17</td>
<td>10</td>
<td>3</td>
<td>76</td>
<td>3.58</td>
<td>5</td>
<td>1</td>
<td>1.06</td>
</tr>
<tr>
<td>27</td>
<td>Auditory tape and computer technology will make braille unnecessary.</td>
<td>0</td>
<td>3</td>
<td>8</td>
<td>45</td>
<td>20</td>
<td>76</td>
<td>1.92</td>
<td>4</td>
<td>1</td>
<td>0.73</td>
</tr>
</tbody>
</table>

Note: SA = Strongly Agree; A = Agree; NUE = Neutral; D = Disagree; SD = Strongly Disagree

Table 4.16: Teachers’ Responses about Braille Literacy (SI#21 - SI#27) (total = 76).
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>n</th>
<th>Positive</th>
<th></th>
<th>Neutral</th>
<th></th>
<th>Negative</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>I enjoy teaching braille.</td>
<td>75</td>
<td>43</td>
<td>57.33</td>
<td>27</td>
<td>36.00</td>
<td>5</td>
<td>6.67</td>
</tr>
<tr>
<td>22</td>
<td>Technological devices should be used to enhance braille, not replace it.</td>
<td>76</td>
<td>63</td>
<td>82.89</td>
<td>10</td>
<td>13.16</td>
<td>3</td>
<td>3.95</td>
</tr>
<tr>
<td>23</td>
<td>The Nemeth code is too complex and should not be taught.</td>
<td>75</td>
<td>46</td>
<td>61.33</td>
<td>27</td>
<td>36.00</td>
<td>2</td>
<td>2.67</td>
</tr>
<tr>
<td>24</td>
<td>Refresher training courses in braille should be required.</td>
<td>75</td>
<td>54</td>
<td>72.00</td>
<td>16</td>
<td>21.33</td>
<td>5</td>
<td>6.67</td>
</tr>
<tr>
<td>25</td>
<td>Braille is not an important learning medium.</td>
<td>76</td>
<td>70</td>
<td>92.11</td>
<td>6</td>
<td>7.89</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>26</td>
<td>In most cases, slate &amp; stylus should be taught to students who use braille.</td>
<td>76</td>
<td>46</td>
<td>60.53</td>
<td>17</td>
<td>22.37</td>
<td>13</td>
<td>17.11</td>
</tr>
<tr>
<td>27</td>
<td>Auditory tape and computer technology will make braille unnecessary.</td>
<td>76</td>
<td>65</td>
<td>85.53</td>
<td>8</td>
<td>10.53</td>
<td>3</td>
<td>3.95</td>
</tr>
</tbody>
</table>

Table 4.17: Teachers’ Attitudes about Braille Literacy (SI#21 - SI#27) (total = 76).
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>SA</th>
<th>A</th>
<th>NEU</th>
<th>D</th>
<th>SD</th>
<th>n</th>
<th>M</th>
<th>Max</th>
<th>Min</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>Most teachers of visually impaired learners do not have satisfactory braille skills.</td>
<td>1</td>
<td>10</td>
<td>47</td>
<td>16</td>
<td>2</td>
<td>76</td>
<td>2.89</td>
<td>5</td>
<td>1</td>
<td>0.70</td>
</tr>
<tr>
<td>29</td>
<td>Legislation requiring the teaching of braille to all legally blind children whose parents request it is a good idea.</td>
<td>6</td>
<td>15</td>
<td>18</td>
<td>26</td>
<td>11</td>
<td>76</td>
<td>2.72</td>
<td>5</td>
<td>1</td>
<td>1.17</td>
</tr>
<tr>
<td>30</td>
<td>Decisions about students’ learning media should be an IEP committee decision.</td>
<td>25</td>
<td>33</td>
<td>16</td>
<td>2</td>
<td>0</td>
<td>76</td>
<td>4.07</td>
<td>5</td>
<td>2</td>
<td>0.81</td>
</tr>
<tr>
<td>31</td>
<td>Generally, student’s braille literacy skills have declined in recent years.</td>
<td>7</td>
<td>19</td>
<td>43</td>
<td>7</td>
<td>0</td>
<td>76</td>
<td>3.34</td>
<td>5</td>
<td>2</td>
<td>0.78</td>
</tr>
</tbody>
</table>

Note: SA = Strongly Agree; A = Agree; NEU = Neutral; D = Disagree; SD = Strongly Disagree

Table 4.18: Teachers’ responses about braille-related issues (SI#28 - SI#31) (total = 76).
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>n</th>
<th>Positive</th>
<th></th>
<th>Neutral</th>
<th></th>
<th>Negative</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>Most teachers of visually impaired learners do not have satisfactory braille skills.</td>
<td>76</td>
<td></td>
<td>18</td>
<td>47</td>
<td></td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Legislation requiring the teaching of braille to all legally blind children whose parents request it is a good idea.</td>
<td>76</td>
<td></td>
<td>21</td>
<td>18</td>
<td></td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Decisions about students’ learning media should be an IEP committee decision.</td>
<td>76</td>
<td></td>
<td>58</td>
<td>16</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Generally, student’s braille literacy skills have declined in recent years.</td>
<td>76</td>
<td></td>
<td>26</td>
<td>43</td>
<td></td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.19: Teachers’ attitudes about braille-related issues (SI#28 - SI#31) (total = 76).
Seventy-six participants responded to SI#25 (*Braille is not an important learning medium*), with a mean score of 1.64 (standard deviation = 0.63) (Table 4.16). Seventy respondents (92.11%) either disagreed or strongly disagreed with the item, and 6 teachers (7.89%) held a neutral attitude toward the item (Table 4.17).

Seventy-six participants responded to SI#22 (*Technological devices should be used to enhance braille, not replace it*), with a mean score of 4.12 (standard deviation = 0.78) (Table 4.16). Sixty-three respondents (82.89%) agreed or strongly agreed with the item description, ten teachers (13.16%) held a neutral attitude toward the description, and 3 teachers (3.95%) disagreed or strongly disagreed with the item description (Table 4.17).

Seventy-six participants responded to SI#27 (*Auditory tape and computer technology will make braille unnecessary*), with a mean score of 1.92 (standard deviation = 0.73) (Table 4.16). Sixty-five respondents (85.53%) either disagreed or strongly disagreed with the item. Eight teachers (10.53%) held a neutral attitude, and 3 teachers (3.95%) agreed with the item (Table 4.17).

Seventy-five participants responded to SI#23 (*The Nemeth code is too complex and should not be taught*), with a mean score of 2.20 (standard deviation = 0.81) (Table 4.16). Forty-six respondents (61.33%) either disagreed or strongly disagreed with the item. Twenty-seven teachers (36.00%) held a neutral attitude, and 2 teachers (2.67%) agreed with the statement (Table 4.17).

Seventy-five participants responded to SI#24 (*Refresher training courses in braille should be required*), with a mean score of 3.85 (standard deviation = 0.82) (Table 4.16). Fifty-four respondents (72.00%) agreed or strongly agreed with the item
description, 16 teachers (21.33%) held a neutral attitude toward the description, and 5 teachers (6.67%) disagreed or strongly disagreed with the item description (Table 4.17).

Seventy-six participants responded to SI#26 *(In most cases, slate & stylus should be taught to students who use braille)*, with a mean score of 3.58 (standard deviation = 1.06) (Table 4.16). Forty-six respondents (60.53%) agreed or strongly agreed with the item description. Seventeen teachers (22.37%) had neutral attitudes, and 13 teachers (17.11%) disagreed or strongly disagreed with the description (Table 4.17).

The survey item #28 *(Most teachers of visually impaired learners do not have satisfactory braille skills)* is designed to explore the subjects’ perceptions of other teachers’ braille skills. Seventy-six participants responded to the item with a mean score of 2.89 (standard deviation = 0.70) (Table 4.18). Forty-seven respondents (61.84%) had neutral attitudes toward the item description, eighteen teachers (23.68%) agreed or strongly agreed with the description, and 11 teachers (14.47%) disagreed or strongly disagreed with the item description (Table 4.19).

The survey item #29 *(Legislation requiring the teaching of braille to all legally blind children whose parents request it is a good idea)* taps the respondents’ feelings about legislative authority and parental assertion in their instructional decision-making. Seventy-six participants responded to the item with a mean score of 2.72 (standard deviation = 1.17) (Table 4.18). Thirty-seven respondents (48.68%) disagreed or strongly disagreed with the item description, twenty-one teachers (27.63%) agreed or strongly agreed with the item, and 18 teachers (23.68%) were neutral toward the item description (Table 4.19).
The survey item \#30 (Decisions about students’ learning media should be an IEP committee decision) furthers the investigation to understand the subjects’ attitudes concerning the function of the IEP conference to determine a student’s learning objectives. Seventy-six participants responded to the item with a mean score of 4.07 (standard deviation = 0.81) (Table 4.18). Fifty-eight respondents (76.32%) agreed or strongly agreed toward the item description, sixteen teachers (21.05%) had a neutral attitude, and 2 teachers (2.63%) disagreed or strongly disagreed with the item description (Table 4.19).

The survey item \#31 (Generally, students’ braille literacy skills have declined in recent years) is to understand subjects’ general observations of braille literacy development in Taiwan. Seventy-six participants responded to the item with a mean score of 3.34 (standard deviation = 0.78) (Table 4.18). Forty-three respondents (56.58%) had neutral attitudes toward the item description, 26 teachers (34.21%) agreed or strongly agreed with the item, and 7 teachers (9.21%) disagreed or strongly disagreed with the item description (Table 4.19).
The survey item #32 is a follow-up examination of the description in SI#31 (*Generally, students’ braille literacy skills have declined in recent years*) and intends to understand teachers’ feelings about current students’ braille knowledge:

*If it is true that braille literacy have declined, the most likely cause of the decline in braille literacy is:*

- (    ) reliance on technology
- (    ) teacher attitudes
- (    ) increase in multiple disability population
- (    ) inadequate teacher preparation
- (    ) emphasis on vision utilization
- (    ) complexity of the braille code
- (    ) teacher incompetence
- (    ) itinerant model / large caseloads
- (    ) other (please describe in the space below):

Even though this particular item asks for a single-choice response, 19 out of the 76 respondents (25%) chose more than one description. As seen in Table 4.20, 36 teachers (47.37%) indicated that “reliance on technology” could contribute to students’ declining braille abilities, followed by “inadequate teacher preparation” reported by 23 teachers (30.26%), and “itinerant model/large caseloads” reported by 20 teachers (26.32%).

Eight teachers provided comments in “Other” to describe the possible reasons for the decline in students’ braille proficiency that were not listed in the item. Two of the eight teachers did not specify details, but simply put “Don’t know” and “None.”
<table>
<thead>
<tr>
<th>Description of Reason</th>
<th># of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliance on Technology</td>
<td>36</td>
</tr>
<tr>
<td>Inadequate Teacher Preparation</td>
<td>23</td>
</tr>
<tr>
<td>Itinerant Model/Large Caseloads</td>
<td>20</td>
</tr>
<tr>
<td>Increasing Students with Multiple Disabilities</td>
<td>14</td>
</tr>
<tr>
<td>Teacher Incompetence</td>
<td>13</td>
</tr>
<tr>
<td>Teacher Attitudes</td>
<td>7</td>
</tr>
<tr>
<td>Complexity of the Braille Code</td>
<td>7</td>
</tr>
<tr>
<td>Emphasis on Vision Utilization</td>
<td>5</td>
</tr>
<tr>
<td>Other (Quotation Below):</td>
<td>8</td>
</tr>
</tbody>
</table>

- A single factor can’t explain the reasons of decrease or progress in students’ braille competence.
- Teachers do not respect their own profession and students do not have enough time to do self practice.
- In a special school, due to the influence of educational inclusion in the recent years, students who are placed in our school had weaker functional abilities. The limited skills determined their braille learning ability.
- Students are not given enough time to do braille reading and writing regularly.
- Students have an increased amount of required content subjects to learn.
- First, the shortage of braille books. Second, mathematic and scientific braille code is too difficult to learn.
- Don’t know
- None

Table 4.20: Teachers’ feelings about possible reasons for the decline in students’ braille proficiency (SI#32).
Interview Data

The following discussion covers the participants’ general opinion and practice of braille literacy instruction for young and beginning braille learners.

The word structure and meaning of a Chinese character. Thirteen teachers commented about the relationship between students’ braille learning and their concepts about printed Chinese characters. First, because context determines the particular meanings for homophones in Chinese characters (Appendix A – Example 2), for braille students whose visual impairments were developed before they entered school, most teachers agreed that teaching Chinese homophones in Zhùyīn (phonetic) braille was actually one of the most challenging experiences that they had in the early literacy stage.

As Teacher M said,

For the older student who types braille on the computer … even though the advanced technology invention makes it possible to output braille texts in print format onto the computer monitor, if the student’s knowledge of the Zhùyīn system and the skills to assemble the phonetic elements are poor, his/her braille writing assignment is still unreadable to sighted people, even with the output in Chinese print format. (Teacher M, 06/13/2006)

Teacher M indicated that even though the key-in software program, can automatically choose from the list of homophones appropriate Chinese characters based on the inputs of the phonetic elements and the text contexts, the program cannot help the student to correct Zhùyīn assembling errors so that the student picks the accurate Chinese characters. Therefore, Teacher Q indicated, accurate pronunciation and phonetic assembling skills in reading and writing are fundamental for beginning braille learners.

However, if teachers want to encourage their students’ higher Chinese literary capacity, Teacher Q emphasized that she has to demonstrate the embossed shapes and
structures of Chinese characters to the student and teach him/her basic Chinese radicals -
the section headers of Chinese characters. Four other teachers (A, N, N, and T) made
similar comments. Teacher R specifically asserted that a braille teacher must introduce
the meaning of the Chinese radical concepts to the student because “seventy percent of
Chinese characters is conceptualized by radicals” (Teacher R, 05/16/2006). Therefore,
understanding the concepts of radicals in constructing Chinese characters is very
important for braille students.

Teachers F, G, and M pointed out that if the student has newly developed
blindness or a deteriorating vision condition, usually his/her braille learning performance
is barely satisfactory. Compared with those congenitally blind students, Teachers F and G
said that the newly blind student’s tactual identification skills in braille learning are much
weaker, but he or she usually can develop an extraordinary memory skill in a short time.
Teacher M said, if there are two students starting to learn braille at the same time, the
totally blind student with less cognitive capacity can outperform the student with low
vision and normal cognitive ability. Teacher G said that, based on her experiences and
those of her colleagues’, a student who tries to learn braille and print at the same time
never performed well in either one. Therefore, she believed that eventually the student
ought to discard either braille or enlarged print for good.

*Issues about braille reading.* The braille reading strategies discussed in this
section were derived from participants’ reflections on braille reading methods and braille
shape or braille numerical position.

*Braille reading methods.* The teachers who were interviewed mentioned four
different braille reading methods. First, Teacher B taught students to read the braille line
starting with both index fingertips horizontally moving from left to right. While both fingers read to the middle of the line, the right finger keeps on reading, and the left finger moves down to the beginning of the next line and waits for the right finger to move down. She emphasized, this is the basic and efficient reading method that all beginning braille students should learn. However, Teachers K and M indicated that they taught students to use both index fingers to read through the braille line and then move down to the beginning of the next braille line altogether. Specifically, Teacher M said that she taught her students to use their right index finger to read the vowel and tone and use their left index finger to read the consonant. While Teacher M believed that using both index fingertips altogether was an efficient and accurate way for the beginner, Teacher G, who is totally blind, taught her students to read braille primarily with their left index finger. She recommended the approach because of her own braille learning experience and also because with practice a student may read with his/her left finger, while simultaneously using the keyboard with his/her right hand to type responses.

Teacher D, who is totally blind, said that his instructional strategies varied, depending on each student’s condition of health and personal preference. For instance, if the student’s preferred index finger was on the left, he would teach the left finger reading and the right finger locating approach, and vice versa. Teacher K also recalled his braille learning experience in elementary school. Although, in the beginning, he was taught to use both hands to read through all the lines together, he said his teacher expected all students to be able to read braille with either or both hands in the end. Therefore, Teacher K argued that, one-handed or both hands, is the most appropriate way to read would be the most efficient way that the student figures out how to read.
Braille shape or braille numerical position. Five teachers mentioned teaching braille shapes and braille numerical positions. The participants suggested two approaches to memorize and identify braille structure in the early or beginning braille learning. First, resource room Teacher R reported that she usually asked her students to memorize the shape of a braille cell, not its numerical pattern. In fact, she tried not to call numerical names of braille cells in early braille learning and suggested that all other colleagues in the resource room do so as well. She said that if students only remember braille cells by their numerical names, their reading speeds would be slower because they would always be keeping track of the numerical positions of the cells. She argued: “The reason for teaching numerical names to students is solely for the students’ convenience of operating the braille writer” (Teacher R, 05/16/2005).

The remaining four teachers indicated that their teaching strategies differed by the individual student’s reading proficiency. Teacher Q said:

It is true that advanced braille readers identify braille cells by their shapes … and students have to memorize each braille cell’s numerical positions as they operate the brailler. Eventually, students should develop the ability to identify braille by both the braille shape and numerical position. (Teacher Q, 04/17/2006)

Teachers G, K, and N said that they found students automatically applying different methods to memorize braille structures. Therefore, their braille teaching strategies were based on each student’s preference and ability.

Instructional materials and devices. As some participants illustrated their braille lesson designs and instruction, they frequently mentioned the assistance of teaching materials they made, adapted from commercial products, or purchased, as well as the
implementation of specially designed computer technology in students’ daily learning. In the following passages, teacher-made learning materials and the implementation of technology will be discussed.

Teacher-made learning materials. As mentioned before, manipulability was a common characteristic for the braille learning materials that some participants (Teachers A, O, P, Q, and T) designed and presented to young students.

Experienced residential school Teacher N introduced a variety of teaching materials and games that she designed for young students with visual impairments. She used drawing pins, blocks, buttons, clay, glue, string, cork boards, and other common materials of different textures and shapes to make tangible games with which typical children were familiar to play, such as chess, treasure hunting, Monopoly, or finger tracing adventure “Roads to the Wonderland” on cardboard. For example, to establish the spatial concept of each braille cell, Teacher N made braille cards (1.5 x 2 inches) with different enlarged braille shapes on them (Figure 4.1). She placed six chairs in the center of the classroom by two rows and three columns and invited six totally blind students to “see the movie.” She acted as the ticket clerk and each student was given a ticket (braille card) to find his/her seat (by the ending number of the embossed braille dots) for the movie. After the students were “physically” familiar with the spatial positions of different braille shapes, she presented a six-drawer storage box (Figure 4.1) and asked each student to put his or her braille card into the matched drawer. Teacher N also made the pegs and pegboard (Figure 4.2) as her instructional tool and students’ practice materials. Teachers
Figure 4.1: Illustration of teacher-made instructional materials: Braille cell cards and the storage box.
Figure 4.2: Illustration of teacher-made instructional materials: Braille cell pegs and the pegboard.
Q and R demonstrated similar designs of braille pegs and pegboards. Teacher Q made longer wooden sticks to insert through the board. The design was for advanced students to identify different directions of each braille cell.

Teacher M recalled one of her routine tasks in the beginning of each semester - making the talking textbook. She explained how the “talking textbook” worked in her classroom teaching when the students in the class had three distinct learning functions:

You know, I’ve tape-recorded all the contents of textbooks by spelling out every single word in very very slow speed. In the beginning of each class, usually I taught the smartest group first because they could learn faster and practice by themselves. When I started to teach the middle-functioning kids, I put the smart group in the far corner of the classroom, played my recorded lesson tape, and asked them to read aloud. While the middle group kids paused to think, for example, the braille numerical name of [m], I walked closer to the smarter group and listened to hear if their reading matched my recording. Then, I put the lowest-functioning group in another corner and taught them to assemble LEGOs for fine motor training, while I was also supervising the other two groups. Just like that. I could keep my eyes on all three groups. (Teacher M, 06/13/2006)

Teacher M made embossed braille on many aluminum boards (Figure 4.3) for the beginning braille learners. She said the beginning learners usually ran their index fingers over the braille cell a lot in order to identify the braille shapes. Because students frequently pricked or sliced their fingers on the braille paper, Teacher M embossed a lot of beginning braille teaching materials on aluminum boards that could be used to read by itself, as well as accompanied by other teaching materials.

Teacher F indicated that his pre-service training did not cover enough braille teaching methods. He recalled his initial braille instruction to a junior high student who was gradually losing his vision: “I designed the teaching materials and methods by my own interpretation. This student lost his vision after he already had learned to read print. The method I designed for him was based on my own braille learning strategies”
Figure 4.3: Picture of teacher-made instructional materials: The completed Zhùyīn braille system on an aluminum board.
(Teacher F, 06/12/2006). The instructional strategy Teacher F designed (Appendix J) is modified and still in use for the beginning braille student who has prior print experiences. He took sighted people’s visual memorizing experiences into consideration and grouped Zhùyīn braille symbols by the visual images of the shapes (Appendix J). Then he made the grouped Zhùyīn /braille units embossed with the “rhymed nonsense poems“ in print on the practice sheet to show that one braille symbol is the reverse of the other.

The following example was the format presented in Teacher F’s practice sheet which includes the poems written in print and the embossed Zhùyīn symbols, braille symbols, and the rectangle frame. In the example below, the phonetic pronunciations are also indicated:

I dined out yesterday with Winnie (ㄨㄟˊㄋㄧˊ [wεi ni]) the Pooh

Who ate (ㄔ `[tʂʰə]`) meat balls (ㄩㄢˊ [yɛn])

But he said fish (ㄩ [y]) eye (ㄧㄢˇ [jɛn ]) was his favorite food.
Teacher F said this design is particularly helpful to older students who receive itinerant service in regular schools. Students can either do the self-guided practice or be assisted by sighted others.

Teacher C commented that he lacked financial support to purchase teaching materials; and if he did get the grants, only few companies in Taiwan provided the catalogues of vision-related assistive products for order. Under this circumstances, he said, what he often did was to surf the websites to see the online product catalogues from other countries, enlarge those product pictures if they were attached, analyze the basic design and functions of the product, and then make the materials on his own.

*The implementation of technology.* The primary technology that participants mentioned in young students’ braille learning phases were Zhùyīn fúhào-related electronic auditory devices. Teachers A, D, G, I, N, and Q all pointed out that young students could benefit from self-learning Zhùyīn fúhào materials through auditory stimulation. Therefore, they suggested that parents buy general Zhùyīn fúhào learning audio tapes or CDs in stores and play them during students’ leisure time at home. Considering students’ particular needs in braille concept development, Teacher M recorded different teaching texts on audio tapes that were helpful in her classroom braille teaching and students’ self-guided learning. Teacher K wrote and recorded the braille nursery rhymes and burned the CDs for students to practice with their parents at home. He also recorded his braille classes and put the electronic sound files on the website for students’ review.

Four teachers (N, O, P, and S) mentioned that technology, especially Chinese braille/print output (The Twin-Vision Braille Printout, Appendix K), has the capacity to
increase braille students’ interactions with sighted people and to help regular class teachers exchange written texts with the students. The braille/print printout was especially helpful to the young students because, as Teacher P said, having such an accessible practice sheet for the visually impaired and the sighted, the regular teachers and the parents had no reason or excuse to ignore the students’ school learning any more. Teacher M also reported that the residential school library converted all of the new books into braille/print corresponding format with this technological innovation.

A variety of electronic devices were not introduced until the participants thought that their students had developed basic braille reading and writing skills. Although technology specialists developed Windows compatible Zhùyīn braille processing programs that braille users could type braille with the regular computer keyboard and read the text outputs from the connected refreshable braille display devices, some teachers still insisted on not teaching the assistive computer skills in the early Braille learning stage. They gave the following reasons: first, Teachers B and G indicated that some computer output formats were inconsistent with the rules of publishing formal braille textbooks, especially in mathematics and science braille symbols. Second, Teacher Q pointed out that the quality of refreshable braille display was not always good. She added that it was common that some dots in some cell positions did not function as well as they should. Moreover, Teacher Q said that, compared with the bulky and expensive devices like computers or electronic notetakers, a braille writer is more flexible, movable, and less costly for young students to use.

Teacher K had a different opinion regarding using computer technology in braille instruction. As a congenitally blind teacher who taught braille and computer technology
in a residential school, he reiterated that teachers of braille students should not limit themselves, but try different instructional approaches. He said, students’ individual learning abilities require different intervening strategies and “you don’t want to wait for one skill to develop while you are wasting their golden learning period for other skills to develop at the same time” (Teacher K, 05/16/2006). For example, he said:

It is normally believed that computer instruction should come after the student has developed considerable braille literacy skills. But I always have the opposite idea …. See, you may have a braille student with other disabilities who is merely able to memorize the numerical position of each Zhùyīn braille symbol. His/her tactile identification skill may be too poor to read braille … in that case, I will let him/her try using the computer to type braille. After s/he has assembled the pronunciation of a character, the computer will read the sound out loud and then s/he can check the accuracy of his/her writing by him/herself …One of my former students also learned the difference between the second tone and the third tone by using a computer. (Teacher K, 05/16/2006)

In addition to the debate on “when to teach computer technology,” the participants also raised the issues of “what technology-related information” and “how much technology knowledge” should be taught to advance students’ braille literacy competency. In a highly technologized program, Teacher B demonstrated her generous knowledge and interest in implementing technology to teach students with visual impairments. She described that they were supervising the college student teacher to teach technology to the braille student in junior high school. The student teacher’s current assignment was to teach the use of recording and sound synthesizing devices and converting, duplicating, and storing skills for the electronic sound files in the computer. In the end, it was expected that the junior high student should submit a braille text printout and a burned CD with the recorded information.
Teacher B added, “There are many assistive software programs designed to improve one’s braille skills only if you know that they really exist” (Teacher B, 05/26/2006). Teachers F, K, and Q also argued that a braille student possessing knowledge and skills of a variety of communicating media (e.g., slate and stylus, braille writer, assistive computer technology) could have more opportunities to outperform their sighted peers. Therefore, Teacher F said that as long as the student has developed the required braille reading and writing skills, s/he should learn to use the convenient, efficient, and accessible assistive devices as much as possible.

The strengths of implementing technology in braille learning, according to the participants’ reports, include the improvement of learning efficiency (Teachers B, D, F, K, and T), the convenience of operation (Teachers B, F, L, and S), the compact designs of some devices (Teachers B, F, and S), interactive and immediate feedback (Teachers B, K, and M), and increasing interpersonal communication between the braille students and the sighted world (Teachers F and L).

However, some participants also mentioned the bad influences of advanced technology intervening into braille instruction. In addition to the high cost of hardware, Teacher R said that specialized maintenance skills are required, which unfortunately are difficult to find. Teacher L thought that the electric power supply was always a bothersome problem with limited battery life or messy electronic cords or cables. Teachers A, D, G, J, L, and R specified how the sound synthesizing technology might encourage listening to texts and discourage students from reading the text in braille by themselves.
Teacher R also expressed her worries of future teachers’ braille competency: teachers of braille students may possibly overlook the fundamental braille literacy skills and primarily rely on the advanced converting or transcribing technology to do the braille tasks for their teaching materials. Thus, she worries that teachers’ braille reading and writing skills will eventually deteriorate. She recalled that the pre-service teacher in the teacher preparation program asked:

Since the technology has been so advanced and convenient today, why do we [vision teachers] still have to learn these [braille reading and writing]? Can’t we just entirely computerize the braille instruction so that more time and effort can be saved to do other coursework? (Teacher R, 05/16/2006)

Teacher R then replied:

If you don’t go through this process personally, you’re unable to understand the students’ learning psychology. Take a swimming coach, for example. It is absolutely impossible for him to coach the beginner to swim by using only the textbook without any real swimming practice. (Teacher R, 05/16/2006)

All in all, teachers who specified the influences of technology also have balanced thoughts about its implementation in braille instruction. Teachers F and J argued that, only if the application meets the present purposes, can assistive technology be an exciting alternative for obtaining information. Teacher F explained:

Mastery of braille literacy should go through a constant process of exploring, probing, comprehending, and integrating phases to psychologically internalize the concepts and skills … if the student has not been using tactile reading and typing on the braille writer for a while, you can just give him a little push, and his memory will come back soon. (Teacher F, 06/12/2006)
He continued in a very optimistic voice:

Thus, suppose today he wants to know a story, why does he read the book page by page if he also has an audio book on hand? Different purposes can be achieved by different channels. It all depends on how you make the judgment …. Even if the story is made to test one’s braille reading accuracy, the student should be able to recover the required level of skills with only a little bit of practice. (Teacher F, 06/12/2006)

Teacher Q indicated that one should be conscious that the advantages of using technology to quickly receive a great amount of information and to save time may have a negative impact. Activities such as listening to the electronic book instead of tactually reading the braille book, or using auditory recording devices to capture the intact sound message instead of using the slate and stylus or a brailler to jot down fragmental notes can impede students’ basic literacy abilities such as reading, writing, composition or critical thinking. “So,” she said, “when the students are at the point of developing the beginning literacy concepts and skills, you want to make sure that the foundation is really solid and precise” (Teacher Q, 04/17/2006). Similarly, Teacher C commented, “There’s no such thing that the faster the technology, the faster you can read Braille … No matter how advanced the technology is, braille reading and writing skills are essential to a braille student. Period” (Teacher C, 05/24/2006).

Teacher K emphasized that some important concepts should be conveyed to students when technology is introduced in the classroom:

I know how to operate the technology, but I don’t have to rely on it totally. If I wish, I can build up a skill that I can always trust by myself, and technology becomes supplemental only when the task is beyond my ability. In terms of using technology, it is I who is operating it, I am not under its control. Therefore, I should understand it completely so that I have a dominating power over it. (Teacher K, 05/16/2006)
Summary

Research question 4 addressed critical issues in braille instruction and is answered with information drawn from survey responses and interview comments. In the survey portions concerning the instruction contents, while more than 90% of the respondents recognized braille as an important learning medium, only 57% indicated that they like to teach braille. Regarding technology and braille instruction, a majority of the teachers agreed that assistive technology should enhance, rather than take the place of, basic braille literacy skills. In addition, more than 60% of the respondents wanted the instruction of the Nemeth code and slate and stylus to remain as parts of the braille curriculum.

As for respondents’ opinions about the issues listed in the survey, less than 25% of the respondents agreed that their colleagues do not have satisfactory braille skills. Furthermore, almost half of the respondents disagreed that legislation should require braille instruction for legally blind students whose parents request it. In fact, more than two thirds of the respondents felt that such decisions regarding reading mode should be made by the IEP team. Additionally, only 34.21% of the respondents agreed or strongly agreed that braille skills have declined in recent years. In the follow-up survey item, the respondents indicated the most likely causes of the decline in braille literacy were “reliance on technology,” “inadequate teacher preparation,” and “itinerant model/large caseloads.”

Three critical issues were identified in the analysis of the interviews. The first was the relationship between braille and print and the importance of Chinese homophones and radicals. The second issue concerned braille reading methods, specifically, different
finger-braille cell tracing movements and memorizing a braille cell by its numerical name or by its cell shape. The third issue was associated with instructional materials and devices which include teacher-made braille learning materials and the implementation of technology in braille instruction.
RQ5: What Recommendations Do In-Service Teachers of Young Visually Impaired Children Suggest to Enhance The Braille Literacy Instruction Curriculum in Teacher Preparation Programs?

The research participants expressed their concerns, reflections, and suggestions regarding various issues in survey responses and during the interview. They provided valuable information that answered Research Question 5 when they responded to SI#11 (My braille training should have included more teaching methodology – Agree/Neutral/Disagree), SI#14 (Please use this space to describe, regarding braille literacy instruction, what was missing from the teacher preparation program), and SI#33 (Please use this space for your comments about braille training or braille literacy instruction), which focus on statements about braille instruction training in the teacher preparation programs in universities and academic institutions. Given the nature of the research design, the interview participants described a variety of reflections and suggestions about braille instruction. However, only a limited number of responses were specific to teacher training programs. The interview data quoted or summarized in this section is basically from the closing comments that the participants made at the end of the interview about future expectations and suggestions that they have to help improve vision teacher training programs.

Twenty-three survey respondents and 13 interview participants had 92 comments or recommendations. Table 4.21 summarizes the topics of comments and the participants’ response frequencies. Eight general comments directly addressed the teacher training programs or educational policymakers. Eighty remarks were related to pre-service
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Table 4.21: Teachers’ topics of comments about teacher training programs.
teacher preparation program design from four perspectives: braille professional competence/course offered, length of braille training term, braille training content, and braille teacher observation and practicum. Four comments were concerned with in-service teachers’ professional development in braille instruction.

**General Teacher Training Program or Educational Policy**

In the eight comments made about the teacher training programs or policymakers, the respondents indicated the need for research-based and practitioner-oriented knowledge in the braille training procedure (e.g., Teacher F: “The program missed studies of braille teaching methods” [Teacher F, 06/12/2006] and survey respondent: “Journal article studies were absent [from the training program]”) and emphasis of rationales for and attitudes toward braille instruction (e.g., Teacher K: “Instructional strategies should be used, not just one, to teach braille” [Teacher K, 05/16/2006] and Teacher Q: “The teacher preparation program should emphasize the significance of holistic education and career planning for the visually impaired” [Teacher Q, 04/17/2006]). The respondents also made arguments in favor of more research activities in the teacher preparation program. A survey respondent said, “It is necessary to establish a braille instruction research group initiated by academic/research institutions or cross-country-boundary vision teacher coalitions” (Teacher A, 05/10/2006). Likewise, Teacher F urged program coordinators at teacher training institutions to set up a research team to organize related issues and conduct nationwide braille studies. He also suggested that a central teaching materials database be developed and managed by a prestigious teacher training institution in the field so that, through this information channel, teaching
experiences and wisdom in the field can be gathered and shared with other vision teachers who often struggled in the past, having to teach alone. Teacher F believed that a central teaching materials database could benefit parents, regular class teachers, and school administrators, as well.

Regarding higher administrative or legislative levels, the survey respondents made the following suggestions: “The teacher preparation programs should be classified by subject matter and by disability category,” “It would be better to have teaching experiences in regular education before participating in the vision teacher preparation programs,” and “The current teacher recruitment policy allows all graduates from the department of special education to teach visually impaired students. How can someone who never studied in a vision-related program and never learned braille teach braille?”

The following discussion presents teachers’ comments and recommendations regarding braille literacy instruction for pre-service teachers’ preparation programs and in-service teachers’ professional development.

Pre-Service Teachers’ Preparation Programs

The data were analyzed by the concerns of program structure and training content. The former covers braille professional competence, courses offered, and length of the braille training term. The latter covers the braille training content and objectives, and braille teaching presentation and practicum.

Professional competence and courses offered. Seven comments were made to indicate the problem of professional shortage in the area of braille literacy, which is one factor that may contribute to no braille courses being offered in some teacher preparation
institutions. In the absence of professionals who are literate in braille, in-service vision
teachers’ braille knowledge and teaching methods may rely on their self-practice. One
teacher remarked, “There were no vision-related credit hours provided in my special
education teacher training program, so I learned vision-related knowledge only after I
graduated.” Another survey respondent said, “In Taiwan, there are very few professionals
in the teacher preparation institutions who have had practical teaching experience in
braille. This is why instructors in the training programs don’t know braille or simply
don’t offer the course.”

*Length of the braille training term.* Six comments made by respondents expressed
a clear message that, in undergraduate courses or post-bachelor training programs, the
braille knowledge and braille teaching methods conveyed in the courses were
quantitatively and qualitatively insufficient. For example, one survey respondent said, “In
the teacher preparation program, braille was a semester course of 2 credit hours (2
hours/week). The learning time was too limited; otherwise, it should include the methods
of making braille testing sheets and editing skills.” Teacher A also indicated: “The
training period was too short. Probably the instructors were knowledgeable in their
professions, but it was difficult to convey their knowledge in such a short time” (Teacher
A, 05/10/2006). Even an experienced vision teacher commented in the survey:

The training time was too short in just 2 summer terms. I could barely handle the
braille learning task even though I already had 8 years of practical teaching
experience at that time. However, for those who had no prior knowledge and
experience, the design of the training program was too rushed and lacked quality.
**Braille training contents and objectives.** In the 80 comments related to pre-service teachers’ training program design, 58 referred to the arrangement of course objectives in the following areas:

**Teaching strategies.** Thirteen respondents indicated the shortage of instructional methods from the pre-service training programs in a variety of perspectives. For example, Teacher C pointed out that braille teaching methods were only mentioned in a small portion of the course “Teaching Methods for Students with Visual Impairments,” not even in the braille course. Teacher J in the interview and some survey respondents also commented that there were no sample lessons or teaching presentations in the whole training program. Teacher E in the interview and some of the survey respondents indicated the needs of practical teaching experiences in real classrooms. Lastly, Teacher C strongly suggested the Ministry of Education or university professionals design systematic braille teaching guidelines for classroom practitioners.

In addition to the descriptive information, the survey responses to SI#11 (My braille training should have included more teaching methodology – agree/neutral/disagree) also indicated their expectations of improving braille instruction in the teacher preparation programs. Sixty-four of 69 survey respondents (92.75%) agreed that their braille training should include more teaching methodology, while 3 teachers had a neutral attitude and 2 teachers disagreed with the statement.

**Braille pre-requisite skills.** In both the interviews and surveys, there were nine comments that indicated that some basic braille learning prerequisites were not addressed in training programs. For example, Teacher O in the interview and four survey respondents felt that the teacher preparation programs did not include sufficient
information about the pre-requisite skills for beginning braille learners. Other respondents itemized the missed skills and knowledge, such as tactile perceptions, orientation concepts, motor, and cognitive skills related to braille learning.

Assistive aids and technology. Nine other comments in both interviews and surveys referred to the introduction of and practice with assistive aids and technology devices. Basically, the respondents’ suggestions showed positive attitudes about using technology in the classroom. For example, one survey respondent reflected, “Government funding is necessary for new inventions in instructional technology aids for braille learners.” Similarly, some teachers felt that more technological capacities and accessibility were needed to improve their braille teaching performance. One survey respondent commented, “I didn’t have enough training to make technology a good assistive device to my teaching.” Another responded stated, “Some vision-related assistive technology devices were introduced, but I didn’t have the chance to operate the devices such as computer for the blind, refreshable braille display, etc. I didn’t know how to use them and to teach students.” Finally, one survey respondent observed that: “Braille-related technology is too expensive.”

Multiple disabilities. Eight comments concerned teaching braille to students with visual and other disabilities. For example, Teacher A indicated that students with other disabilities may use different reading media that require different instructional design, materials, and strategies. One survey respondent also indicated:
When I attended the training program, we only set our focus on the training of a single disability: vision. This made my practical teaching difficult. I had to discover my own teaching strategies if I had a visually impaired student with other disabilities. It is true that every student has his or her individual differences from others, and teachers should not be limited to any single specific teaching strategy. However, if we had received more related information regarding visually impaired students with other disabilities earlier, we would be better prepared psychologically when a student like this came to us in the future.

Likewise, Teacher R indicated that the training program should address the decision-making strategies regarding the reading media of visually impaired students and those with other disabilities.

**Tactile and braille materials production.** Five comments were made in reference to the making of braille materials and documents. A specific request was made by Teacher Q that the training programs address the design of more tactile graphic materials in the areas of mathematics and sciences. Other comments were related to the format of braille testing materials. One survey respondent made the following comment:

The braille course didn’t provide transitional strategies to cope with different testing formats from elementary school to junior high school, especially the testing design in *The Basic Competence Test for Junior High School Students*, which may impede the curriculum consequentiality between elementary school and junior high school.

Similarly, Teacher C, an itinerant teacher, commented on students in itinerant programs:

If a visually impaired student is placed in the itinerant program, very possibly the student’s disability condition isn’t too severe or perhaps he has a considerable degree of cognitive ability. Students with such conditions need no more than modified or adaptive learning materials. If supplied, I think, their learning progress should be quicker, more efficient, and easier to accelerate. (Teacher C, 05/24/2006)
**Braille vs. Print.** Four comments were made about teaching braille students the concept of print. As mentioned earlier, Zhùyīn fúhào is one of the most important pre-requisites to learn Zhùyīn braille. However, most vision teachers did not have general Chinese literacy instruction skills to teach Zhùyīn fúhào. Therefore, Teacher R suggested the training program should introduce the relationship between Zhùyīn fúhào in print and Zhùyīn braille and the related teaching methods. She also suggested that teaching Chinese homophones to braille students should be included in the training program. A survey respondent also recommended that the training programs cover the “teaching and counseling skills for those who are learning through dual reading media.”

**Other braille codes.** Four comments were made, indicating the need for braille training to include knowledge of other braille codes besides Zhùyīn (literal) braille. The respondents specifically said they would like to learn more about the Nemeth (mathematics and scientific) braille code. They also expressed their preference for learning more rules of English literary braille.

Three comments were briefly made to indicate that the teacher training program should include the methods of braille assessment. Teacher R asserted the importance of the visually impaired students’ functional vision and strongly recommended that teacher training programs should introduce knowledge of functional vision and differences between functional vision assessment and clinical vision assessment.

**Braille teacher observation and practicum.** Seven comments made by respondents were related to teacher observation and practicum. Observing the loosening of teacher recruitment regulations and the disconnection between the training courses and the actual classroom teaching, the respondents suggested that the teacher preparation
program personnel, or even the related policymakers, think about the following alternatives: First, Teacher R argued a sample class/school model of teaching practicum is necessary so that good quality of teaching experiences can be shared. Second, Teacher K suggested that the teacher preparation programs provide pre-service teachers opportunities to get to know students with visual impairments through developing student tutorial programs, teaching practicum by living with students in residential schools, or volunteering in students’ extra-class activities. Third, to have a big picture of the vision field in the whole education system, Teacher R insisted that educators of students with visual impairments need to have prior general education teaching experience. Teacher B wished teachers of general classes and special classes could periodically rotate their teaching assignments so that all teachers could establish a holistic concept of education by mutual understanding and practical teaching experience.

**In-Service Teachers’ Professional Development**

Four comments made by the respondents expressed hopes that the teacher training institutions can provide braille-related professional development programs for the current teaching practitioners, such as professional discussion, study groups, instructional symposiums, and conferences. Teacher F indicated one benefit of participating in professional activity: “By ways of participating in the braille-related instructional symposiums or conferences and having the professional conversation and information exchange, the grass-roots itinerant teachers can improve their braille teaching
competency with each other” (Teacher F, 06/12/2006). A survey respondent even recommended that educational policymakers propose a certificate of braille competency to demonstrate teachers’ braille expertise and proof of continuing braille proficiency.

Summary

Research question 5 was answered by the participants’ responses to three survey items and the interview participants’ comments and expectations specifically directed at the program development by teacher preparation institutions. Ninety-two comments from 23 survey respondents and 13 interview participants yielded general suggestions for three areas: (a) teacher preparation programs and policymakers, (b) recommendations to pre-service teacher preparation programs, and (c) in-service teachers’ professional development in braille instruction.

In these areas, 80 comments were related to pre-service teachers’ preparation programs in professional competence and courses offered, length of the training term, the training content, and teacher observation and practicum. The need for braille teaching strategies in the training courses was one of the frequently mentioned issues. Knowledge of braille pre-requisite skills and braille-related technology were two other areas that teachers thought were insufficient in their braille training courses. In addition, they felt that their teacher preparation programs neglected braille instruction for visually impaired students with other disabilities, curriculum design, general instructional strategies, and ways to make or acquire teaching materials. Lastly, some teachers indicated their concerns about the loosening of teacher recruitment regulations and the disconnection between their training courses and actual classroom teaching.
CHAPTER 5

DISCUSSION

This final chapter first presents a summary of the study, the findings, and the implications of the findings on the existing theoretical frameworks on braille instruction. Next, the limitations of the study are offered, followed by recommendations for future research and teacher training programs.

The research topic was derived from the investigator’s prior participatory observations in two self-contained elementary vision classrooms in the United States. Two teachers demonstrated different braille literacy instruction styles to teach young students with visual impairments, which led the investigator to look for differences between the two classes, to question the influences behind those differences, and examine how braille literacy is taught to young visually impaired students in Taiwan.

Before answering these questions, the investigator felt the need to learn who the in-service teachers of visually impaired students are in Taiwan and how they feel about and teach braille literacy to beginning learners. The research questions for this study pertained to these teachers of visually impaired students in Taiwan:

1. What are the educational backgrounds of the participants who teach braille literacy to young and beginning learners in Taiwan?
2. What are the differences and similarities in availability of instructional resources for teachers in different educational environments?

3. What are the approaches or techniques used by teachers to implement braille literacy practices?

4. What are teachers’ concerns about braille instruction?

5. What recommendations do in-service teachers of young visually impaired children suggest to enhance the braille literacy instruction curriculum in teacher preparation programs?

To collect rich and contextual information from a broad scope, the investigator adopted the mixed methods design. The Teachers’ Braille Training Survey adapted and modified from Wittenstein’s (1993b) survey and the Teachers’ Braille Interview Inventory designed by the investigator were used to collect quantitative and qualitative information. As the only comprehensive data source about teachers’ braille training, Wittenstein’s survey is pertinent for this study, enabling the investigator to collect data that meets her research goals regarding braille training. Even though the current discussion will refer to some of Wittenstein’s findings, the investigator is only interested in the general tendency toward the survey descriptions for the larger sampling in the United States.

The total number of surveys used in the study was 76 and the number of interview participants was 18. The quantitative results of the survey responses were reported by a number count, percentage, mean, standard deviation, and median. The descriptive responses to the survey items and the interview inquiries were carefully reviewed and,
with the assistance of qualitative data analysis software *NVivo* 2.0, they were coded by the themes of the research questions. The following section discusses significant findings and their implications.

**Discussion and Implications of Research**

The survey data showed that the average size caseload of respondents was 3.91 students who used braille or braille and another reading mode. Wittenstein (1993b) found in his study in the United States that the average braille caseload of vision teachers was 3.8. The Taiwanese vision teachers’ average braille caseload in 2006 is close to that of vision teachers in the United States at the time of his study. Vision teachers’ average caseload in the U.S. at the time of the current study is unclear; however, the average caseload of the vision teachers in Taiwan was 10 students, which according to Griffin-Shirley et al. (2004) is close to the recommended ratio of one teacher to eight students.

The data also indicated that the respondents had an average 12.3 years of teaching experience overall, of which an average 7.5 years were spent with visually impaired students. The respondents had almost five years of experience in general education prior to teaching visually impaired students, which was an advantage in their teaching. Likewise, vision teachers in the U.S. usually took undergraduate courses in another field of education, such as elementary, secondary, or generic special education and obtained teaching certification in another area before the vision field (Koenig & Holbrook, 2000a). Koenig and Holbrook (2000a) pointed out that “an understanding of the total educational context is essential for developing and implementing educational programs for students with visual impairments” (p. 269). This statement is supported by
the participants in the current study that regular class teaching experience before taking vision teacher preparation programs provides an understanding of the larger educational context.

In terms of the survey respondents’ self-perception of their braille proficiency and braille teaching skills in different time frames, the teachers seemed to be more confident about their own braille skills at the time they had finished their braille training courses than they did at the time of this study. In contrast to their confidence in braille skills, their confidence in their braille teaching skills was higher at the time of the study than they were at the time that they had finished their training courses. It could be that the teachers did not have much practical teaching experience to know what braille knowledge would be needed when they completed their training. These in-service teachers’ confidence in their ability to do the job increased as they accumulated problem-solving experiences in braille instruction after years of working with blind students.

Concerning the survey respondents’ competency about their knowledge of the Nemeth code, the findings in the current study indicated that nearly 45% of the survey respondents were not confident about their knowledge of the Nemeth code, and 31.08% felt neutral about their competency in this knowledge. The percentage of the group with a negative attitude toward their knowledge of the Nemeth code was almost the same (46.8%) as that of a larger group of American vision teachers in Wittenstein’s (1993b) study. Similarly, DeMario, Lang, and Lian (1998) noted in their survey study that teachers of students with visual impairments felt more confident and had a more positive attitude toward literary braille than toward the Nemeth code.
According to Tournaki and Podell (2005), teachers who felt confident about making a difference in their students’ learning outcomes tended to make more flexible academic predictions about their students with different characteristics. For example, a teacher who feels confident about her knowledge of English may also feel confident about teaching it and believe that she can motivate her students to make progress, regardless of her students’ behavioral problems or in spite of her students’ use of another language as their primary communication language at home. The teacher’s confidence about her English proficiency contributes to her self-assurance about being able to adjust the lesson plan to accommodate her students’ individual differences. Based on Tournaki and Podell’s (2005) finding, the investigator concluded that teachers’ uncertainty about their knowledge of the content of what they are teaching may influence their teaching competency and their expectation of students’ learning.

In the current study, only 60% of the respondents had attended braille-related professional activities since the completion of their initial braille training. While teachers felt confident to teach braille based on their accumulated experiences, they expressed less confidence in their own braille skills. Consequently, 70% of the respondents agreed or strongly agreed that braille refresher courses should be required. Therefore, the investigator concluded that teacher training programs could be helpful if they offered in-service professional activities to address the practical need to improve braille skills, for example, the refresher course for the Nemeth code or the English literary braille courses.

It is worth noting that in the initial teacher preparation programs, "Teaching Methods of Early Special Education" was the least frequently completed among all 50 courses listed in the set of courses for teaching certificates. Similarly, "Braille and Visual
Aids" was the least frequently completed course out of the ten courses required for vision teacher certification. In the interviews, the investigator found that most of the participants were certified in the field of general education and general special education in elementary grade levels. They indicated their braille teaching experience with young students was based on their self-study and information obtained from their colleagues. In fact, two interview participants expressed their appreciation to the investigator for giving them the interview inventory to which they could refer in their future braille curriculum design. Through the interview, they realized what they had missed in their past teaching preparation. The results of the current study suggest that teacher preparation programs in Taiwan should stress more knowledge of and teaching strategies for young braille students’ literacy development, and a systematic braille learning curriculum should be developed for teachers of visually impaired students in Taiwan. Program coordinators of professional development programs should ensure that the braille curriculum design and the problem-solving forum are presented empirically to in-service vision teachers of young and beginning braille students.

More than 90% of the participants recognized braille as an important reading medium, but only 57% reported that they enjoyed teaching braille. One reason may be that on the surface, teaching Zhùyīn braille configurations and the system of rules for pronunciation and intonation may be overshadowed by all of the other tasks the teacher must manage each day. Therefore, teachers may see teaching Zhùyīn braille as an obligation that has nothing to do with liking to teach it or not.

Even though the interview participants articulated their braille curriculum designs and teaching approaches, only a few teachers in the interviews mentioned their
assessments of students’ braille learning outcomes in the early learning stages. As many participants complained, this may be because, currently, there is no standardized braille assessment tool developed in Zhùyīn braille for any grade level. This, again, coincides with the participants’ suggestion that vision professionals should team up with one another and use their braille expertise to develop a systematic braille learning curriculum for Taiwan.

Using technology in education for students with severe visual impairments has become a recent focus in Taiwan (Lin, 2002b). The emphasis can be shown in the respondents’ selection of the technology course as the second most frequently selected course after all the required courses in the set of 50 certificate courses. Kapperman and Sticken (2000) suggested, assistive technology is “a means of facilitating inclusion, rather than a task or skill area that must be accommodated in an inclusive setting” (p. 506). The participants in the current study understood the statement appropriately. Even though the participants felt that students, teachers, and parents benefit greatly from using technology in braille instruction (and the local administrative departments also expect them to do so), the participants in the study generally recognized that basic braille literacy skills should not be replaced by high technology.

The participants also indicated that technology could be the most probable factor that impedes students’ braille progress and vision teachers’ reduced braille competency. However, given that the participants in the current study were teachers of young and beginning braille students, these teachers’ instruction primarily focus on fostering students’ basic braille literacy skills. Most of the respondents indicated not using braille assistive technology in the beginning stages, which is different from what Kapperman
and Sticken (2000) suggested that technology “needs to be introduced to students with visual impairments at least as early as it is presented to sighted children in the general education program (p. 506). Therefore, further research is needed to explore when and how to use technology to help develop students’ braille literacy competency.

More than two thirds of the teachers in the current study indicated that the choice of a student’s reading mode should be made by the student’s Individualized Education Program (IEP) team. Only about 28% of the respondents agreed or strongly agreed that parental wishes backed up with legislative enforcement should determine a student’s reading mode. These findings help the investigator understand how the IEP approach was executed since 1997, when the legal requirement was initially put in law. The investigator indeed captured some interesting insights from interviewing the teachers about the application of IEP. It is understandable that most teachers appreciated having IEP meetings to make critical decisions and furthermore, these meetings are required by law. However, according to the interview participants, some school districts in Taiwan have not yet required schools to follow the appropriate procedures for IEP meetings.

One of the complaints was that these meetings merely produced “thick and beautiful” student portfolios, but they felt that these amounted to nothing but bothersome paperwork – the information in the portfolio was barely used for programming the student’s future education plan. Besides, one interview participant indicated that few personnel come to IEP meetings. Usually, the meetings are attended by the vision teacher, the regular class teacher, and the student’s parents. Related therapists or specialists who are also members of IEP are seldom assigned to a student or even those who are assigned to a student rarely come to the meetings. Consequently, the vision
teacher is the one doing the most talking throughout the meeting and his/her opinions dominate the decisions that are made. The survey data showed a salient positive tendency that agreed with the significance and functions of the IEP teamwork in student’s braille learning. However, for different reasons, not all vision teachers in Taiwan appreciated the IEP meetings. Therefore, future research should explore vision teachers’ perspectives on building an efficient and effective IEP teamwork for braille students.

Other professionals who are working with the braille student can serve as helpful resources for the vision teacher’s braille instruction. Surprisingly, the investigator found that, in the few interviews in which the participants mentioned working with other therapists or specialists, the participants had more negative than positive attitudes and reflections about their interactions with colleagues. These findings coincide with Chang’s (2004) conclusion in his survey study of itinerant vision teachers in Taiwan. Among the 24 cities and counties where the itinerant vision teachers provided educational services for elementary and junior high school students, only five cities or counties had followed the multidisciplinary team model to devise students’ educational plans. Chang found that the most challenging parts of teamwork included “professionals of different specialties hold strong departmental egoism against each other” and “each professional’s role is not clearly defined.”

As one interview participant in the current study actually pointed out, the transdisciplinary instruction model is not applicable because, typically, a teacher’s authority in a classroom is seen as unchallengeable in Taiwan. The investigator concluded the possible reason is that some vision teachers, especially those itinerant teachers in rural or remote mountain areas, teach alone most of the time without much
opportunity to collaborate with others. Therefore, they may not realize the benefits that can result from opportunities for collaboration. Similarly, in the United States, even though D’Andrea (1997) proposed that visually impaired students with other needs would benefit from the transdisciplinary team model, she also noted that vision teachers may oppose this approach because the concept of role release will challenge their specialties.

Take Zhùyīn braille instruction, for example. The participants identified Zhùyīn braille instruction as a very important topic because braille students’ literacy proficiency primarily depends on the foundation of Zhùyīn fūhào. However, it is not uncommon for a braille teacher to have young students who have never learned Zhùyīn fūhào. A teacher who was trained to serve visually impaired students in school possibly may not know much about teaching the Chinese language. Even though the teacher is able to teach Zhùyīn fūhào for the preparation of Zhùyīn braille, s/he may need more preparation to make the proper connection between Chinese in print and Zhùyīn braille, not to mention to teach Chinese homophones and radical concepts to advance his/her students’ Chinese literacy skills.

As Lewis and Allman (2000) indicated, it is difficult to define a vision teacher’s role in providing help for a student’s instructional needs related to his/her vision limitation. It is especially true for a young braille student’s literacy instruction that involves developing general literacy knowledge (i.e., alphabets, numbers, or Zhùyīn fūhào) and disability-related skills (i.e., [pre]braille skills).

Research on students who are typically developing as well as students with special needs conducted in the United States has shown that children benefit from their teachers’ collaboration with one another. Based on the U.S. model, policy makers, researchers, and
teachers of students with special needs in Taiwan also have concluded that teachers’ collaborative work would be beneficial to students. Collaboration among teachers was in fact made into law in Taiwan in 1997, requiring teachers to participate in IEP teams that consist of parents, regular, and special education teachers, specialists, and government and school administrators. Only due to this mandate have teachers in Taiwan started to work with one another in the last ten years, sharing their knowledge and experience of braille instruction. However, according to reports from the interview participants, teachers appear to participate in IEP only because they have to.

Vision teachers in Taiwan are expected to know how to best teach braille. However, most IEP team members do not know much about braille and braille instruction to be able to develop a visually impaired student’s education plan. As the investigator learned from interviews with teachers of young and beginning braille students, it is important to define a vision teacher’s educational responsibilities. The investigator learned that it is equally important to integrate the students’ concrete experiences into their braille learning in the classroom, which cannot be accomplished by the vision teacher’s efforts alone, but requires teamwork. This is where the IEP team can make an enormous difference. A good relationship between IEP team members can be beneficial in many ways, as can be seen in the following example from the itinerant vision Teacher I’s experience with the regular class teacher:
Whenever I wanted to talk with Ms. Wu (the regular class teacher) about Mei’s braille progress, she was always busy on her whole class … you know, the last class section before kids go home … Well, I’m not that kind of person sitting there, waiting, and seeing people busily running here and there. So, sometimes I would help Ms. Wu collect students’ worksheets, clean the blackboard, watch the students exit the classroom … That was a great way to reduce my waiting time so that soon I could talk with Ms. Wu. Now all the students in the class know me, like to see me, and they learn things from me to help Mei in the class … Above all, Ms. Wu and I have built a relationship blended with both friendship and fellowship, and we have no problems communicating with each other. See? Everybody is happy! (Teacher I, 06/09/2006)

The findings of the current study show that IEP team members can do much toward making connections between braille learning and students’ daily experiences so that the students’ understanding is enriched. The investigator concluded from interviews that IEP team members need to share their concerns and experiences with one another, so that they can learn from each other’s experiences with teaching braille to young children with visual impairments. Through teamwork, they can develop an appropriate education plan that better meets each visually impaired student’s needs.

**Limitations**

1. *Discrepancy between two versions of the instruments.* Use of an instrument translated from English to Chinese introduces the possibility for more misunderstandings of concepts. The investigator used procedures to decrease errors, but this possibility cannot be ignored.

2. *Weak confirmability.* During the interviews, the investigator often felt that the participants had a lot more to say than could be covered within the time frame for the research, since she was in Taiwan for only three months to recruit participants for the study as well as distribute 135 surveys and conduct 18 interviews. The
investigator did offer each interviewee the opportunity to contact her by phone or email with any concerns. However, none took her up on that offer, and she was unable to make time to schedule a follow-up interview in which to double-check some points or to confirm and further discuss others.

3. *Elimination of some information in order to preserve confidentiality.* Much valuable data, especially those from the interviews, such as the teachers’ education background or their students’ characteristics, were eliminated for confidentiality concerns. What actually is presented in the results of this study only represents part of the information that was collected.

4. *Time of year that the study was conducted.* A number of teachers declined to participate in the interviews because it was the time of year when student evaluations for placement in the city/county were due. They were busy preparing their reports and could not make time to meet with the investigator. If they had had more time to meet with the investigator and evaluate their teaching practice, they may have arrived at more observations to share.

5. *Methods for recruiting participants.* Because the investigator had to rely on responsible administrators for survey distribution to teachers of young visually impaired students, the investigator had no way of confirming directly that all of the teachers who completed the surveys were teaching young and beginner braille students. In addition, interview participants who were recommended by administrators or their peers and who agreed to be interviewed may not be representative of the group of Taiwanese teachers who teach young children with visual impairments to read *Zhùyīn* braille.
Recommendations

1. The current study did not distinguish between sighted teachers and visually impaired teachers. Some participants in the interview who were recommended for their outstanding teaching themselves happened to be visually impaired. Their confidence in their braille knowledge may derive from their similar disability experiences with their students, which would be particularly valuable for future research. A study of how teachers who themselves are visually impaired teach braille reading to visually impaired students can help researchers learn more about teachers’ viewpoints and strategies for braille instruction.

2. The investigator found that itinerant participants expressed more concerns about braille instruction due to the itinerant service model. However, she could not build a prolonged relationship with the interview participants due to the research time restriction. She was in Taiwan for only three months, and while she did offer each interviewee the opportunity to contact her if they had any concerns, she did not have the luxury of time to schedule follow-up interviews in which the participants could air out their concerns. Therefore, case studies that examine the caseloads of itinerant teachers of young and beginning braille students would be valuable in future research. Such studies would enable researchers to determine what and how itinerant teachers teach young braille students in their limited itinerant schedules each week.

3. The current study as a pioneer research aims to explore the vision teachers’ general concerns about teaching braille to young and beginning learners. Based on
their accumulated teaching experiences, the interview participants provided valuable information about braille pre-requisite skills in each braille developmental stage. Therefore, a survey study of how to determine what teachers of visually impaired students need to know about teaching children braille can help the researcher to collect consensus criteria of braille literacy instruction.

4. Future research can explore how early braille literacy skills are developed on a daily basis at the kindergarten level. Case studies of literacy instructional practices of kindergarten teachers who teach young students with visual impairments can provide insight into how young children develop braille literacy.

5. Future research needs to define the responsibilities of vision teachers, regular class teachers, parents, school administrators, and other paraprofessionals in developing an educational plan that is fitted individually for each braille student. Clearly defined roles for IEP team members can lead to positive rapport among them so that they are effective and efficient in their collaboration to develop an educational plan for each particular student’s needs.

6. The survey respondents expressed much concern that technology may be responsible for the decrease in braille literacy—that is, technological devices are threatening to replace braille. For this reason, most of the interview participants expressed their reluctance to use assistive devices in their braille instruction in the early braille developmental stages. At the same time, they were well aware that the use of technology in educating visually impaired students is on the rise. Therefore, further research is needed to explore when to introduce technology and how to use it so that it does not replace, but compliments braille.
7. To date, the Taiwanese educational system lacks a systematic Zhùyīn braille learning curriculum. Therefore, it would be valuable for researchers and experienced teachers in the field of teaching students with visual impairments to team up and prepare guidelines that vision teachers can follow to develop such a curriculum.

8. Teacher training programs could be helpful if they addressed the practical need to improve braille skills, for example, the refresher course for the Nemeth code or the English literary braille courses, in both pre-service and in-service professional activities. These teacher training programs would be most effective if they connected classroom theory with classroom practice by arranging fieldwork with university supervision, followed by opportunities for classroom inquiry and reflection. They especially need to look into expanding ways to incorporate courses that address braille readiness and pre-braille skills with attention to visually impaired students who also have other disabilities.

9. Teacher preparation programs in Taiwan need to stress more knowledge of, and teaching strategies for, young braille students’ literacy development. Additionally, a systematic braille learning curriculum for teachers of visually impaired students in Taiwan needs to be developed. Coordinators of professional development programs need to ensure that the braille curriculum design and the problem-solving forum are presented empirically to in-service vision teachers of young and beginning braille students to bring up to par teachers who lack knowledge of and teaching strategies in early childhood special education.
10. Pre-service teacher training programs need to emphasize developing future teachers’ collaborative skills with regular class teachers, parents, school administrators, and other paraprofessionals.

11. Local education agencies should encourage local public libraries to continue to provide accessible, free, and convenient services for braille students, their families, and their teachers.
LIST OF REFERENCES


Lin, C.-J. (2002a). The content analysis of annual reports of guidance practices of local school district regarding the education of mainstreamed visually impaired students. 特殊教育與復健學報, 10, 199-205.


APPENDIX A

THE ZHÙYĪN BRAILLE SYSTEM
The Zhùyīn Braille System

There are 59 symbols in the Zhùyīn braille system which includes:

1. Onset Consonant Symbols (21 symbols)

<table>
<thead>
<tr>
<th>Zhùyīn fúhào</th>
<th>b</th>
<th>p</th>
<th>m</th>
<th>f</th>
<th>d</th>
<th>t</th>
<th>n</th>
<th>l</th>
<th>g</th>
<th>k</th>
<th>h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hányǔ Pīnyīn</td>
<td>b</td>
<td>p</td>
<td>m</td>
<td>f</td>
<td>d</td>
<td>t</td>
<td>n</td>
<td>l</td>
<td>g</td>
<td>k</td>
<td>h</td>
</tr>
<tr>
<td>IPA</td>
<td>[p]</td>
<td>[pʰ]</td>
<td>[m]</td>
<td>[f]</td>
<td>[t]</td>
<td>[n]</td>
<td>[l]</td>
<td>[k]</td>
<td>[kʰ]</td>
<td>[x]</td>
<td></td>
</tr>
<tr>
<td>Zhùyīn Braille</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

2. Vowel Symbols

1) Vowels written with one symbol (16 symbols)

<table>
<thead>
<tr>
<th>Zhùyīn fúhào</th>
<th>ㄚ</th>
<th>ㄛ</th>
<th>ㄜ</th>
<th>ㄝ</th>
<th>ㄞ</th>
<th>ㄟ</th>
<th>ㄠ</th>
<th>ㄡ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hányǔ Pīnyīn</td>
<td>a</td>
<td>o</td>
<td>e</td>
<td>ê</td>
<td>ai</td>
<td>ei</td>
<td>ao</td>
<td>ou</td>
</tr>
<tr>
<td>IPA</td>
<td>[a]</td>
<td>[o]</td>
<td>[ɛ]</td>
<td>[ɛ]</td>
<td>[ai]</td>
<td>[ei]</td>
<td>[ao]</td>
<td>[ou]</td>
</tr>
<tr>
<td>Zhùyīn Braille</td>
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</table>

225
2) Vowels written with two symbols (22 symbols)

<table>
<thead>
<tr>
<th>Zhùyīn fūhào</th>
<th>ㄧㄚ</th>
<th>ㄧㄛ</th>
<th>ㄧㄝ</th>
<th>ㄧㄝ</th>
<th>ㄧㄠ</th>
<th>ㄧㄡ</th>
<th>ㄧㄢ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hàn yǔ Pīnyīn</td>
<td>ia/ya</td>
<td>ie/ye</td>
<td>iao/yao</td>
<td>iu/you</td>
<td>ian/yan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPA</td>
<td>[ia]</td>
<td>[io]</td>
<td>[iɛ]</td>
<td>[iau]</td>
<td>[iou]</td>
<td>[iɛn]</td>
<td></td>
</tr>
<tr>
<td>Zhùyīn Braille</td>
<td>●●</td>
<td>●●</td>
<td>●●</td>
<td>●●</td>
<td>●●</td>
<td>●●</td>
<td>●●</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Zhùyīn fūhào</th>
<th>ㄧㄣ</th>
<th>ㄧ尢</th>
<th>ㄧㄥ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hàn yǔ Pīnyīn</td>
<td>in/yin</td>
<td>iang/yang</td>
<td>ing/ying</td>
</tr>
<tr>
<td>IPA</td>
<td>[in]</td>
<td>[ian]</td>
<td>[iɛn]</td>
</tr>
<tr>
<td>Zhùyīn Braille</td>
<td>●●</td>
<td>●●</td>
<td>●●</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Zhùyīn fūhào</th>
<th>ㄨㄚ</th>
<th>ㄨㄛ</th>
<th>ㄨㄟ</th>
<th>ㄨㄢ</th>
<th>ㄨㄣ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hàn yǔ Pīnyīn</td>
<td>ua/wa</td>
<td>uo/wo</td>
<td>uai/wai</td>
<td>uai/we</td>
<td>uan/wan</td>
</tr>
<tr>
<td>IPA</td>
<td>[ua]</td>
<td>[uo]</td>
<td>[uai]</td>
<td>[uei]</td>
<td>[uan]</td>
</tr>
<tr>
<td>Zhùyīn Braille</td>
<td>●●</td>
<td>●●</td>
<td>●●</td>
<td>●●</td>
<td>●●</td>
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</table>

<table>
<thead>
<tr>
<th>Zhùyīn fūhào</th>
<th>ㄨㄠ</th>
<th>ㄨㄠ</th>
<th>ㄨㄥ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hàn yǔ Pīnyīn</td>
<td>uang/wang</td>
<td>weng</td>
<td></td>
</tr>
<tr>
<td>IPA</td>
<td>[uan]</td>
<td>[uon]</td>
<td></td>
</tr>
<tr>
<td>Zhùyīn Braille</td>
<td>●●</td>
<td>●●</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Zhùyīn fūhào</th>
<th>ㄩㄝ</th>
<th>ㄩㄢ</th>
<th>ㄩㄣ</th>
<th>ㄩㄥ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hàn yǔ Pīnyīn</td>
<td>üeh/yüe</td>
<td>üan/yüan</td>
<td>ün/yün</td>
<td>ioung/yong</td>
</tr>
<tr>
<td>IPA</td>
<td>[ye]</td>
<td>[yen]</td>
<td>[yn]</td>
<td>[iong]</td>
</tr>
<tr>
<td>Zhùyīn Braille</td>
<td>●●</td>
<td>●●</td>
<td>●●</td>
<td>●●</td>
</tr>
</tbody>
</table>

Besides, there are five tonic braille symbols in Zhùyīn braille system:

<table>
<thead>
<tr>
<th>Zhùyīn Tone</th>
<th>ㄧ (omit)</th>
<th>ˊ</th>
<th>ˇ</th>
<th>ˋ</th>
<th>˙</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tone Name</td>
<td>First Tone (Yǐnpíng)</td>
<td>Second Tone (Yánpíng)</td>
<td>Third Tone (Shǎng)</td>
<td>Forth Tone (Qù)</td>
<td>Light Tone (Rǜ)</td>
</tr>
<tr>
<td>Description</td>
<td>High level</td>
<td>High Rising</td>
<td>Low dipping</td>
<td>High Falling</td>
<td></td>
</tr>
<tr>
<td>IPA</td>
<td>[˥]</td>
<td>[˧˥]</td>
<td>[˨˩˦]</td>
<td>[˥˩]</td>
<td></td>
</tr>
<tr>
<td>Zhùyīn Braille</td>
<td>●●</td>
<td>●●</td>
<td>●●</td>
<td>●●</td>
<td>●●</td>
</tr>
</tbody>
</table>

226
Example 1: Meaning, pronunciation, Zhùyīn ㄆㄚˋ and Zhùyīn Braille of Chinese character

<table>
<thead>
<tr>
<th>Character</th>
<th>八</th>
<th>拔</th>
<th>把</th>
<th>爸</th>
<th>吧</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Definition</td>
<td>Eight</td>
<td>To pull out</td>
<td>To hold</td>
<td>Father</td>
<td>Indicates suggestion</td>
</tr>
<tr>
<td>Hàn yǔ Pīnyīn</td>
<td>bā</td>
<td>bá</td>
<td>bǎ</td>
<td>bà</td>
<td>ba</td>
</tr>
<tr>
<td>IPA</td>
<td>[pa˥˩]</td>
<td>[pa˧˥]</td>
<td>[pa˨˩˦]</td>
<td>[pa˥˩]</td>
<td>[pa]</td>
</tr>
<tr>
<td>Zhùyīn fūhào</td>
<td>ㄅㄚ</td>
<td>ㄅㄚˊ</td>
<td>ㄅㄚˇ</td>
<td>ㄅㄚˋ</td>
<td>ㄅㄚ․</td>
</tr>
<tr>
<td>Zhùyīn Braille</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Character</th>
<th>Radical w/ meaning</th>
<th>IPA</th>
<th>English Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>爸</td>
<td>父 - father</td>
<td>[pa˥˩]</td>
<td>father, papa</td>
</tr>
<tr>
<td>霸</td>
<td>雨 - rain</td>
<td>[pa˥˩]</td>
<td>rule by might rather than right</td>
</tr>
<tr>
<td>罷</td>
<td>网(⺄) - net</td>
<td>[pa˥˩]; [pʰ˧˥]</td>
<td>cease, finish, stop; give up</td>
</tr>
<tr>
<td>壩</td>
<td>土 - earth</td>
<td>[pa˥˩]</td>
<td>embankment; dam</td>
</tr>
<tr>
<td>把</td>
<td>手(扌) - hand</td>
<td>[pa˨˩˦]; [pa˥˩]</td>
<td>hold, take; guard; regard as; handle</td>
</tr>
<tr>
<td>靶</td>
<td>革 - leather</td>
<td>[pa˨˩˦]; [pa˧˥]</td>
<td>target; shooting; knife handle</td>
</tr>
</tbody>
</table>

Note: The italics mean the pronunciation of [pa˥˩] and the matched definitions of the pronunciations to the character.
Example 3: A Chinese sentence with English translation, pronunciation (in Hányǔ Pīnyīn, IPA and Zhùyīn fūhào) and its braille written form (with no space between cells).

<table>
<thead>
<tr>
<th>Sentence</th>
<th>爸爸看報紙。</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Papa reads the newspaper.</td>
</tr>
<tr>
<td>Hányǔ Pīnyīn</td>
<td>bà ba kàn bào zhǐ .</td>
</tr>
<tr>
<td>IPA</td>
<td>p a ˥˩ p a ㄑ an ˩ p aɔ ˩ tʂ ㄝ_j .</td>
</tr>
<tr>
<td>Zhùyīn fūhào</td>
<td>ㄅㄚˋ ㄅㄚ ‥ ㄎㄢ ˋ ㄅㄠˋ ㄓ깝 。</td>
</tr>
</tbody>
</table>
| Zhùyīn Braille | 🅱️盷 harming_braille_scores "@
APPENDIX B

THE SPECIAL EDUCATION SYSTEM

IN TAIWAN
## The Special Education System in Taiwan

<table>
<thead>
<tr>
<th>Stage</th>
<th>Age</th>
<th>Regular School</th>
<th>Special School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Childhood</td>
<td>3</td>
<td>Kindergarten</td>
<td>Kindergarten Class</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>(Self-Contained Class &amp; Inclusion Class)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compulsory</td>
<td>6</td>
<td>Elementary School</td>
<td>Elementary School Class</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>(Self-Contained Class, Resource Class, &amp; Regular Class)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9</td>
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<td>10</td>
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<td></td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senior High School Education</td>
<td>16</td>
<td>Senior High School/Vocational School (Self-Contained Class, Resource Class, &amp; Regular Class)</td>
<td>Senior High School Class/Vocational School Class</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher Education</td>
<td>20</td>
<td>University &amp; 4-Year College</td>
<td>5-Year College</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>22</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Regular School:**
Regular school is divided into kindergarten, elementary school, junior high school, senior high school (vocational school), and university and 4-year college.

**Special School:**
Special school is divided into 3 types:
1. Including kindergarten class, elementary school class, and junior high school class.
2. Including kindergarten class, elementary school class, junior high school class, and senior high school class (and vocational school class).
3. Only including junior high school class and senior high school class/vocational school class.

APPENDIX C

THE GUIDELINES OF
CONTENT COURSES AND CREDIT HOURS FOR
PRE-SERVICE SPECIAL EDUCATORS
The Guidelines of Content Courses and Credit Hours
for Pre-Service Special Educators

I. General Education Curriculum (at least 10 credit hours)
   A. Early Childhood Education: Completion of all required courses by early childhood
      teacher training programs; foundation courses for general education and methods
      of instruction.

   B. Elementary School Education: Completion of all required courses by elementary
      teacher training programs; foundation courses for general education and methods
      of instruction.

   C. Junior and Senior High School Education: Completion of all required foundation
      courses by junior and senior high school teacher training programs and methods
      of instruction.

II. Special Education Curriculum (at least 30 credit hours)
   A. Courses for general special education (all required): 10 credit hours
      1. Introduction to Exceptional Children: 3 credit hours
      2. Educational Assessment of Exceptional Learners: 3 credit hours
      3. Practicum/Planned Field Experience in Special Education Classroom: 4 credit
         hours

   B. Courses by field study (at least 20 credit hours)
      1. Required courses
         a) Gifted and Talented Education (at least 12 credit hours)
            (1) Introduction of Gifted and Talented Education: 2 credit hours
            (2) Teaching Materials and Methods for Gifted and Talented Students: 4
                credit hours
         (The courses listed above are required. Three courses should be selected from
         the following 9 courses)
            (3) Creativity Education: 2 credit hours
            (4) Leadership Education: 2 credit hours
            (5) Counseling Services and techniques for Gifted and Talented Students: 2
                credit hours
            (6) Instruction of Independent Studies for Gifted and Talented Students: 2
                credit hours
            (7) Case Study in Gifted and Talented Education: 2 credit hours
            (8) Gifted and Talented Education in Mathematics: 2 credit hours
            (9) Gifted and Talented Education in Science: 2 credit hours
            (10) Gifted and Talented Education in Language Arts: 2 credit hours
            (11) Gifted and Talented Education in Arts and Music: 2 credit hours
b) Physical and Mental Disabilities (at least 10 credit hours)
   (1) Rationales and Practices of Individualized Education Program: 2 credit hours
   (2) Teaching Materials and Methods for Students with Disabilities: 4 credit hours

(The courses listed above are required. Two courses should be selected from the following 4 courses)
   (3) Contemporary Issues and Trends in Special Education: 2 credit hours
   (4) Behavioral Changing Strategies: 2 credit hours
   (5) Special Child Development: 2 credit hours
   (6) Parent-Teacher Collaboration and Family Supporting System: 2 credit hours

2. Elective Courses
   a) Based on the regulations of the Special Education Law, each teacher preparation program should provide courses according to the teacher training rationales, staffing and facilities, and the program specialty of the institution. The courses listed below are suggested for consideration.

   b) Students are encouraged to take courses from different disability areas in order to develop their comprehensive professional proficiency.

   c) Students who missed the required coursework should be able to take similar courses from the elective course list with the same credit hours.

   d) Gifted and Talented Education (at least 8 credit hours)
      (1) Theory and Implementation of Multiple Intelligences
      (2) Career Counseling for Gifted and Talented Students
      (3) Individualized Education Program for Gifted and Talented Students
      (4) Gifted and Talented Students and Minority Ethnicity
      (5) Parent-Teacher Collaboration and Family Supporting System for Gifted and Talented Students
      (6) Training of Higher Psychological Processing
      (7) Educational Models for Gifted and Talented Students
      (8) Resource Room Programming and Management
      (9) Administration and Legislation of Special Education

   e) Physical and Mental Disabilities (at least 10 credit hours)
      (1) Resource Room Programming and Management
      (2) Professional Collaboration and Communication
      (3) Technological Implementation in Special Education
      (4) Special Education Classroom Practices
      (5) Special Education Environmental Design
(6) Transition from School to Employment and Community Life for Students with Disabilities
(7) Vocational Education for Students with Disabilities
(8) Sex Education for Students with Special Needs
(9) Case Studies
(10) Orientation and Mobility
(11) Introduction of Visual Impairments
(12) Braille and Visual Aids
(13) Ophthalmology
(14) Teaching Materials and Methods for Students with Visual Impairments
(15) Introduction of Hearing Impairments
(16) Introduction to Audiology
(17) Introduction to Speech-Language Communication
(18) Audiological and Speech Training
(19) Basic Sign Language
(20) Teaching Materials and Methods for Students with Hearing Impairments
(21) Introduction to Mental Retardation
(22) Training of Daily Living Skills
(23) Adapted Physical Education
(24) Teaching Materials and Methods for Students with Mental Retardation
(25) Introduction to Severe and Multiple Disabilities
(26) Teaching Materials and Methods for Students with Severe and Multiple Disabilities
(27) Introduction Children’s Cognition and Learning Theories
(28) Introduction to Learning Disabilities
(29) Learning Disabilities and Remedial Approaches
(30) Introduction to Communication Disorders
(31) Speech-Language Development and Remediation
(32) Communication Training
(33) Implement of Communication Aids
(34) Introduction to Early Intervention
(35) Teaching Materials and Methods of Early Special Education
(36) Introduction to Behavioral and Emotional Problems
(37) Introduction to Autism
(38) Teaching Materials and Methods to Students with Autism
特殊教育教師資職前教育課程教育專業課程科目及學分

教育部 令
中華民國九十二年十月二日
台中（三）字第0920141412號

壹、一般教育專業課程：至少十學分
一、學前教育階段：依幼稚園教師資職前教育課程教育專業課程科目及學分所列教學基本學科課程、教學基礎課程、教育方法學課程必修科目中選列。
二、國民小學教育階段：依中等學校、國民小學教師資職前教育課程教育專業課程科目及學分所列國民小學教師教學基本學科課程、教育基礎課程、教育方法學課程必修科目中選列。
三、中等學校教育階段：依中等學校、國民小學教師資職前教育課程教育專業課程科目及學分所列中等學校教師教育基礎課程、教育方法學課程必修科目中選列。

貳、特殊教育專業課程：至少三十學分
貳之一、特殊教育共同專業課程（十學分）皆為必修
1、特殊教育導論（三學分）
2、特殊教育學生評量（三學分）
3、特殊教育教學實習（四學分）

貳之二、特殊教育各類組專業課程（至少二十學分）
一、特殊教育各類組必修課程
（一）資賦優異類至少必修十二學分
1、資優教育概論（二學分）
2、資賦優異學生教材教法（四學分）
（以上皆為必修，以下至少九科選三科）
1、創造力教育（二學分）
2、領導才能教育（二學分）
3、資優學生心理輔導（二學分）
4、資優學生獨立研究指導（二學分）
5、資優教育專題研究（二學分）
6、數學資優教育（二學分）
7、科學資優教育（二學分）
8、語文資優教育（二學分）
9、藝術才能優異教育（二學分）
（二）身心障礙類至少必修十學分
1、個別化教育計畫的理念與實施（二學分）
2、身心障礙學生教材教法（四學分）
（以上皆為必修，以下至少四科選二科）
1、特殊教育論題與趨勢（二學分）
2、行為改變技術（二學分）
3、特殊兒童發展（二學分）
4、親師合作與家庭支援（二學分）

二、特殊教育各類組選修課程
（一）請依特殊教育法之規定，由各校就師資培育理念、條件及特色自行規劃，各科目之學分數亦由各校自訂。左列科目供參考。
（二）為培育全方位之「身心障礙」教師，可就特殊教育各類組選修課程之身心障礙類中彈性選取科目。
（三）特殊教育各類組必修課程未修習之科目，可自行增列於特殊教育各類組選修課程中選修，惟其科目名稱及學分數與必修課程一致。
（四）資賦優異類至少選修八學分
1、多元智能理論與應用
2、資優學生生涯輔導
3、資優學生個別化教育計畫
4、特殊族群資優教育
5、資優學生親職教育
6、高層思考訓練
7、資優教育模式
8、資源教室方案與經營
9、特殊教育行政與法規
（五）身心障礙類至少選修十學分
1、資源教室方案與經營
2、專業合作與溝通
3、特殊教育行政與法規
4、科技在特殊教育之應用
5、特殊教育班級實務
6、特殊教育環境規劃
7、身心障礙學生生涯與轉銜
8、身心障礙學生職業教育
9、特殊教育學生兩性教育
10、個案研究
11、定向行動
12、視覺障礙
13、點字與視覺輔具
14、眼科學
15、視覺障礙學生教材教法
16、聽覺障礙
17、聽力學
18、語言溝通法
19、聽能與說話訓練
20、手語
21、聽覺障礙學生教材教法
22、智能障礙
23、生活技能訓練
24、適應體育
25、智能障礙學生教材教法
26、重度與多重障礙
27、重度與多重障礙學生教材教法
28、兒童認知與學習概論
29、學習障礙
30、學習困難與補救策略
31、溝通障礙
32、語言發展與矯治
33、溝通訓練
34、溝通輔具應用
35、早期介入概論
36、學前特教學生教材教法
37、情緒障礙
38、社會技能訓練
39、嚴重問題行為處理
40、自閉症
41、自閉症學生教學策略
APPENDIX D

THE SURVEY AND

THE INTERVIEW INVENTORY
Appendix D1: The Teachers’ Braille Training Survey

The Teachers’ Braille Training Survey

1. I am a teacher of the blind and visually impaired certified by the Department of Education.

(  ) Yes, and I am certified in ________________ (City/County)

(  ) No

I have other certificates of teaching in:
____________________________________________________________________

2. My current teaching assignment can be described as:
(Please check all that apply)

(  ) residential school
(  ) self-contained class
(  ) resource room
(  ) itinerant program
(  ) consultant service for teachers/parents
(  ) early intervention

(  ) other ______________________________

3. My current caseload is described below:
   Number of students ______
   Number of dual media (braille/print) users ______
   Number of braille users ______
   (If none, please indicate the year in which you last worked with a student using braille: ____ )

4. I have ______ years of total teaching experience.
   I have ______ years of experience with visually impaired students.
5. [Optional] My primary reading mode is

( ) braille
( ) dual media (print & braille)
( ) print
( ) tape

6. ( ) I have taken braille training course and finished in the year of _______
   
or
   ( ) I never had any braille training (continue on item #12)

7. I received my initial braille training at:
   (Please check all that apply)

   ( ) undergraduate course at University/College ______________________________
   ( ) graduate course at University/College ________________________________
   ( ) self-instruction courses (e.g. learning materials, online instruction)
   ( ) other ____________________________________

   * ( ) check here if course was taken as part of a degree program

8. My braille training included:

   ( ) transcription, rule knowledge, formatting, proofreading
   ( ) the above plus some (10% of class time) methodology in the teaching of braille reading
   ( ) the above plus an emphasis (more than 10%) on methodology in the teaching of braille reading

9. My braille training included:
   (Please check all that apply)

   ( ) historical perspective ( ) instructional technology, in:
   ( ) braille readiness ( ) braille notetaker
   ( ) reading methodology ( ) braille printers
   ( ) instructional materials ( ) scanners/optical character recognition system
   ( ) demonstration lessons ( ) refreshable braille displays
   ( ) experience with braille users ( ) speech synthesizer/screen-reading software
   ( ) others __________________________
collaborative skills with those who have less or no experience in teaching braille to students with severely visual impairments
knowledge and instructional strategies for visually impaired students with additional disabilities
others

10. My braille training required me to:
(Please check all that apply)

demonstrate -
( ) proficiency with braillewriter
( ) ability to read braille
( ) knowledge of braille reading methodology
( ) proficiency with slate & stylus
( ) proficiency in the Nemeth code
( ) knowledge of assistive aids
( ) knowledge of instructional technology

( ) develop teacher-made materials for braille instruction
( ) write lesson plans
( ) present sample lessons
( ) evaluate curricula
( ) review journal articles related to braille instruction

11. My braille training should have included more teaching methodology.

( ) agree ( ) neutral ( ) disagree

12. I have participated in the following professional development programs:
(Please check all that apply)

( ) braillle refreshing workshop(s)
( ) online braillle courses
( ) professional braillle literacy conference(s)
( ) other
13. I have taken the following courses*: 
(Please check all that apply)

<table>
<thead>
<tr>
<th>Course</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(     ) Introduction to Exceptional Children</td>
<td></td>
</tr>
<tr>
<td>(     ) Educational Assessment of Exceptional Learners</td>
<td></td>
</tr>
<tr>
<td>(     ) Practicum in Special Education Classrooms</td>
<td></td>
</tr>
<tr>
<td>(     ) Rationales and Practices of Individualized Education Program</td>
<td></td>
</tr>
<tr>
<td>(     ) Teaching Methods for Students with Disabilities</td>
<td></td>
</tr>
<tr>
<td>(     ) Contemporary Issues and Trends in Special Education</td>
<td></td>
</tr>
<tr>
<td>(     ) Behavioral Changing Strategies</td>
<td></td>
</tr>
<tr>
<td>(     ) Special Child Development</td>
<td></td>
</tr>
<tr>
<td>(     ) Parent-Teacher Collaboration and Family Supporting System</td>
<td></td>
</tr>
<tr>
<td>(     ) Resource Room Programming and Management</td>
<td></td>
</tr>
<tr>
<td>(     ) Professional Collaboration and Communication</td>
<td></td>
</tr>
<tr>
<td>(     ) Administration and Legislation of Special Education</td>
<td></td>
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<tr>
<td>(     ) Technological Implementation in Special Education</td>
<td></td>
</tr>
<tr>
<td>(     ) Special Education Classroom Practices</td>
<td></td>
</tr>
<tr>
<td>(     ) Special Education Environmental Design</td>
<td></td>
</tr>
<tr>
<td>(     ) Transition from School to Employment and Community Life for Students with Disabilities</td>
<td></td>
</tr>
<tr>
<td>(     ) Vocational Education for Students with Disabilities</td>
<td></td>
</tr>
<tr>
<td>(     ) Sexual Education for Students with Special Needs</td>
<td></td>
</tr>
<tr>
<td>(     ) Case Studies</td>
<td></td>
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<tr>
<td>(     ) Orientation and Mobility</td>
<td></td>
</tr>
<tr>
<td>(     ) Introduction of Visual Impairments</td>
<td></td>
</tr>
<tr>
<td>(     ) Braille and Visual Aids</td>
<td></td>
</tr>
<tr>
<td>(     ) Ophthalmology</td>
<td></td>
</tr>
<tr>
<td>(     ) Teaching Methods for Students with Visual Impairments</td>
<td></td>
</tr>
<tr>
<td>(     ) Introduction of Hearing Impairments</td>
<td></td>
</tr>
<tr>
<td>(     ) Introduction to Audiology</td>
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<td>(     ) Teaching Methods for Students with Severe and Multiple Disabilities</td>
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<td>(     ) Introduction to Children’s Cognition and Learning Theories</td>
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<td>(     ) Introduction to Learning Disabilities</td>
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<td>(     ) Introduction to Behavioral and Emotional Disorders</td>
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<td>(     ) Training of Social Skills</td>
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<td>(     ) Management of Severe Behavioral Problems</td>
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<td>(     ) Introduction to Autism</td>
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<tr>
<td>(     ) Teaching Methods to Students with Autism</td>
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</tr>
</tbody>
</table>

14. Please use this space to describe, regarding braille literacy instruction, what was missing from the teacher preparation program:

---

* The Special Education Unit, The Ministry of Education (2003). The Guideline of Content Courses and Credit Hours for Special Educators. Taiwan.
Please rate the following statements on a scale on 1 to 5:

5= strongly agree
4 = agree
3 = neutral
2 = disagree
1 = strongly disagree

15. When I completed my braille training I felt that my braille skills were satisfactory. _______
16. When I completed my braille training I felt that my ability to teach braille was satisfactory. ______
17. I currently feel that my braille skills are satisfactory. ______
18. I currently feel that my ability to teach braille is satisfactory. ______
19. My knowledge of The Nemeth code is satisfactory. ______
20. I am confident in my ability to make decisions concerning my students’ learning media. ______
21. I enjoy teaching braille. ______
22. Technological devices should be used to enhance braille, not replace it. ______
23. The Nemeth code is too complex and should not be taught. ______
24. Refresher training courses in braille should be required. ______
25. Braille is not an important learning medium. ______
Please rate the following statements on a scale on 1 to 5:

5 = strongly agree
4 = agree
3 = neutral
2 = disagree
1 = strongly disagree

26. In most cases, slate & stylus should be taught to students who use braille. _______
27. Auditory tape and computer stylus technology will make braille unnecessary. _______
28. Most teachers of visually impaired learners do not have satisfactory braille skills. _______
29. Legislation requiring the teaching of braille to all legally blind children whose parents request it is a good idea. _______
30. Decisions about students’ learning media should be an IEP committee decision. _______
31. Generally, students’ braille literacy skills have declined in recent years. _______
32. If it is true that braille literacy have declined, the most likely cause of the decline in braille literacy is:

( ) reliance on technology
( ) teacher attitudes
( ) increase in multiple disability population
( ) inadequate teacher preparation
( ) emphasis on vision utilization
( ) complexity of the braille code
( ) teacher incompetence
( ) itinerant model / large caseloads
( ) other (please describe in the following space): ____________________________
                   ___________________________________________________________________
                   ___________________________________________________________________
                   ___________________________________________________________________

33. Please use this space for your comments about braille training or braille literacy instruction (e.g. teaching reflection, suggestions for teacher preparation programs, students characteristics for braille learning, educational delivery services, language usage, cultural variety, resource bank, parent/community (dis)support, policy influences, professional relationship, etc.)

~ Thank you very much for your participation ~
教師點字訓練問卷
– 台灣修訂版，2005年（原Wittenstein版本，1993）

1. 我是教育局審定合格的視障教育教師。

(     )是的。我的視障教育資格隸屬（登記）於 __________________(市/縣)
(     )不是

我還領有下列項別的教師證書：

________________________________________________________________

2. 我目前從事的教學工作是在：
（請畫記所有符合的項目）

(     )特殊教育（包括住宿式）學校
(     )自足式班級
(     )資源教室
(     )巡迴諮詢輔導方案
(     )提供老師/家長諮詢服務
(     )早期療育
(     )其它：__________________________________________________

3. 我目前負責教學/輔導的學生個案（工作負擔）：

學生總數：_______

學習雙重閱讀媒體（點字與大字體）的學生數：_______

學習點字的學生數：_______

（若目前沒有學生個案輔導，您過去最後一次輔導學生學習點字是在民國哪一年？
____年）

4. 我所有的教學經驗（從開始教書到現在，包括今年）共有 _______年。

我與視障學生的互動與教學經驗（從開始接觸到現在）共有 _______年。
5. [自由作答] 我主要的閱讀媒體（方式）是：

( ) 點字
( ) 雙重媒體（大字體與點字）
( ) 一般印刷體
( ) 錄音帶

6. ( ) 我曾上過點字訓練課程，並於民國________年修完點字訓練課程。

或

( ) 我從未接受過任何點字訓練。（請接第12題）

7. 我的初級點字訓練是受訓於：
（請畫記所有符合的項目）

( ) ______________________________ 大學/學院的大學教育系所課程

( ) ______________________________ 大學/學院的教育研究所課程

( ) 自我指導課程（如：學習教材、線上教學）

( ) 其它：____________________________

*（ ）上述的訓練課程是教學資格/學位修習的必修科目之一

8. 我的點字訓練包括：

( ) 點字轉譯、規則、格式、校對
( ) 點字轉譯、規則、格式、校對，並加上一些（約10%的上課時間）點字閱讀的教學教法
( ) 點字轉譯、規則、格式、校對，並加上相當份量（多於10%的上課時間）的點字閱讀的教學教法

9. 我的點字訓練包括：
（請畫記所有符合的項目）

( ) 點字的歷史與發展  ( ) 教學科技，包括：
( ) 點字學習的先備要素  ( ) 筆記型點字電腦
( ) 點字閱讀的原理與方法  ( ) 點字印表機
( ) 點字的教學教材  ( ) 影像掃描器/光學文字辨識系統
( ) 點字教學的課程演示  ( ) 點字觸摸顯示器
( ) 與點字使用者的相關經驗  ( ) 語音合成器/電腦螢幕閱讀軟體
( ) 其它：__________________________
10. 我接受的點字訓練要求我要能夠：
（請畫記所有符合的項目）

展現 -

( ) 熟練操作點字機的技巧
( ) 我點字閱讀（模讀/視讀）的能力
( ) 我對點字閱讀方法的知識與理解
( ) 我熟練使用點字板與點字筆的能力
( ) 我熟練使用聶美茲數學及科學點字記號（The Nemeth code）的能力
( ) 我對輔助器材的知識與理解的能力
( ) 我對點字學習相關的教學科技的知識

( ) 自製點字教學教材
( ) 設計點字教學教案
( ) 作教學演示
( ) 作課程評量
( ) 閱讀並評論點字教學相關的學術文章

11. 我所受過的點字訓練應該包含更多的教學教法。

( ) 同意     ( ) 可有可無     ( ) 不同意

12. 我曾參與過以下的學術研習活動：
（請畫記所有符合的項目）

( ) 點字複習研習營/班
( ) 線上點字學習課程
( ) 點字讀寫相關的學術研討會

( ) 其它： ____________________________________________
13. 我曾經修過下列課程※：
（請畫記所有符合的項目）

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14. 就點字教學而言，我當年的職前教育/師資培訓學程未能重視到以下要點：
（請敘述於以下空白處）

※所列課程摘自中華民國行政院教育部特殊教育小組於民國92年修訂之「特殊教育教師師資職前教育課程教育專業課程科目及學分」─「特殊教育共同專業課程」及「特殊教育各類組（身心障礙類）專業課程」。
請依提示的不同程度評量各項敘述：

1 = 非常不同意
2 = 不同意
3 = 中立
4 = 同意
5 = 非常同意

● 點字教學態度

15. ________ 當我結束點字訓練課程時，我對自己的點字技巧感到滿意。
16. ________ 當我結束點字訓練課程時，我對自己教授點字的能力感到滿意。
17. ________ 我滿意自己目前的點字技術。
18. ________ 我滿意自己目前教授點字的能力。
19. ________ 我滿意自己對聶美茲點字記號（The Nemeth code）的知識。
20. ________ 我自信我有能力（觀察、檢測）協助我的學生決定最適合的學習媒體（點字或大字體）。
21. ________ 我喜歡教授點字。
22. ________ 科技輔具的使用應著重在於提升學生的點字學習能力，而非完全取代點字。
23. ________ 聶美茲點字記號（The Nemeth code）過於複雜，所以沒有教授的必要。
24. ________ 視障教育老師應該被要求去上點字複習課程。
25. ________ 點字不算是一種重要的學習媒體。
點字相關議題看法

26. ________ 大體而言，使用點字摸讀的學生都應該學習點字板和點字筆的使用。

27. ________ 錄音卡匣與電腦科技的應用將使點字變得不再被需要。

28. ________ 大部分視障教育老師的點字技術都差強人意。

29. ________ 如果訂定這樣的一條律法：只要法定盲學生的家長要求讓學生學習點字，則點字教學就必須要實行。我認為這是一個很好的構想。

30. ________ 「最適合學生使用的學習媒體」必須要經由個別化教學方案小組的討論才能做出決定。

31. ________ 一般來說，近年來學生點字閱讀與書寫技巧有退步的趨勢。

32. ________ 如果近年來學生點字閱讀與書寫能力的確有退步的趨勢，最可能造成這退步的主要原因是：(請畫記一項)

   ( ) 對科技的高度仰賴
   ( ) 教師的態度
   ( ) 視障學生人數的激增
   ( ) 不完善師資培育系統
   ( ) 過度強調視力的使用
   ( ) 點字記號太過複雜
   ( ) 過度強調視力的使用
   ( ) 過度強調視力的使用
   ( ) 不完善師資培育系統
   ( ) 過度強調視力的使用
   ( ) 其它，請敘述：

33. 如果你對點字訓練或點字讀寫教學相關的議題有其它的看法，請陳述於以下空白處（如：教學反思與檢討、對師資培育學程的建議、學生的個別特質與點字學習、不同的教育安置與輔導模式、語言使用問題、文化或城鄉差距、教學資源中心的協同幫助、家長及社區的支持度、教育政策的影響、與專業人員的關係等）。

～非常感謝您的參與～

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Appendix D2: The Teachers’ Braille Instruction Interview Inventory

The Teachers’ Braille Instruction Interview Inventory

*Please specify your teaching experiences and approaches regarding the following braille instruction areas:*

**Emergent Braille Literacy**

1. **To teach early literacy skills and modeling techniques to the student, you**
   1) Read aloud to the student. If so, how?
   2) Develop the student concepts of “book”. If so, how?
   3) Encourage the student to learn early reading & writing skills. If so, how?
   4) Other ________________________________

2. **To work with parents/caregivers to expand the child’s general literacy concepts, you**
   1) Engage and encourage parents to engage adult/child verbal interaction of literacy activities. If so, how?
   2) Engage and encourage parents to engage two or more adults to role play in literacy activities (e.g., broadcasting animal story). If so, how?
   3) Ensure the availability of books & writing materials in school and home environment. If so, how?
   4) Provide opportunities for the student to observe adults (e.g., teachers or parents) engaging in functional reading & writing tasks (e.g., reading a recipe or writing shopping lists), and encourage parents to do so. If so, how?
   5) Explain to the student why the adult places value on reading. If so, how?
   6) Other ________________________________

3. **To foster the development of the student’s auditory skills, you**
   1) Design activities to enhance the student’s auditory awareness and attention (e.g., listening to different instrumental sounds). If so, how?
   2) Design activities to promote the student’s auditory memory (e.g., Ask the student to describe what animals are in the story that was just told). If so, how?
   3) Other ________________________________
4. To develop the student’s hand-finger cooperation skills, you
   1) Design activities for the student to experience surfaces of objects made of
different textures and in different sizes and shapes. If so, how?
   2) Provide opportunities for the student to learn to pick up small objects with thumb,
index finger, and middle finger. If so, how?
   3) Design activities for the student to learn to transfer objects from one hand to
another. If so, how?
   4) Design activities for the student to learn to locate and align objects accordingly. If
so, how?
   5) Other ________________________________

5. To help parents / caregivers obtain learning materials in accessible media (e.g.,
braille books), you
   1) Help parents to establish the required knowledge for the child’s needs for literacy
learning. If so, how?
   2) Provide parents information resources to obtain the accessible media for the
student. If so, how?
   3) Other ________________________________

6. To bridge the student’s development from the “Emergent Braille Literacy” stage
to the “Early Formal Braille Literacy”, you
   1) Provide manipulable materials (e.g. stuffed animals) related to the story in story
time. If so, how?
   2) Discuss the child’s literacy skills with other professionals (e.g. physical therapist,
occupational therapist, speech and language therapist) and cooperate with them. If
so, how?
   3) Discuss the child’s literacy environmental accessibility with other professionals
and cooperate with them. If so, how?
   4) Provide opportunities for the child to transfer written messages (in print or
braille) between parents and the teacher. If so, how?
   5) Other ________________________________

Early Formal Braille Literacy

7. To teach the student tactile motor skills, you teach the student to
   1) Practice stacking blocks. If so, how?
   2) Thread beads. If so, how?
   3) Put shapes in shape-sorters. If so, how?
   4) Play jigsaw puzzles. If so, how?
   5) Turn book pages. If so, how?
   6) On a thick cardboard, “sew” with yarn/string through the punched holes. If so,
how?
   7) Other ________________________________
8. **To foster the student’s early braille-recognition, you**
   1) Explain the relations between Zhuyin Symbols and semantics to the student. If so, how?
   2) Provide opportunities for the student to explore the different/similar structures of the braille words. If so, how?
   3) Put braille name labels on classroom objects (*e.g.* name tags on tables/seats, closet, or toys). If so, how?
   4) Other __________________________________________________________________________

9. **To increase the student’s conceptual knowledge of/and vocabulary skills, you**
   1) Encourage the student to identify the beginning sounds and matched Zhuyin braille words of familiar objects [*e.g.* 兔/ㄆㄨˋ ↦ /r/] . If so, how?
   2) Introduce vowel sounds (*e.g.* ㄚ、ㄟ、一、ㄛ、ㄨ) and explain their phonic functions to the student. If so, how?
   3) Teach the student to sing nursery rhymes. If so, how?
   4) Other __________________________________________________________________________

10. **To increase the student’s listening skills, you**
   1) Help the student learning to identify different sounds in environment. If so, how?
   2) Design activities to promote the student’s sound localization skills (*e.g.*, Ask the student to walk toward the teacher who is giving the verbal direction). If yes, how?
   3) Design activities to promote the student’s auditory memory (*e.g.*, Ask the student to describe the story heard from the audio tapes). If so, how?
   4) Ask the student to refresh class discussion. If so, how?
   5) Encourage the student to share daily experiences with one another and report in class. If so, how?
   6) Help the student to identify the sounds of the braille Zhuyin symbols (*e.g.* Provide auditory toys with braille Zhuyins on it). If so, how?
   7) Other __________________________________________________________________________

11. **To foster the student’s early reading and writing skills, you**
   1) Hold the student sitting in front of you and read a braille story book to him/her by leading the fingers to explore braille words on the book.
   2) Provide the student with audio books and corresponding braille paper books for free reading. If so, how?
   3) Design activities for the student to practice wrist flexibility in school or at home (*e.g.*, put different sizes of objects into the different size of screw-type lidded jar). If so, how?
   4) Ask the student to make a toy list by using materials provided (*e.g.*, beads, beans, string, clay, or braille paper). If so, how?
   5) Provide braille word cards, braillewriter and braille paper for free imitation. If so, how?
12. To foster the student’s motivation for reading & enjoyment of reading, you
   1) Prepare the student a rich literacy learning environment by providing tools for free exploration (e.g. paper, pencils, crayons, and braillewriter). If so, how?
   2) Encourage the student to share reading or engage literacy activities with other visually impaired children. If so, how?
   3) Other___________________________

13. To bridge the student’s development from the “Early Formal Braille Literacy” stage to the “Beginning Braille Literacy” stage, you
   1) Prepare rich daily and familiar objects in classroom environment. If so, how?
   2) Encourage the student to engage in role playing with others. If so, how?
   3) Encourage the student’s significant adults to engage literacy activities with the child. If so, how?
   4) Encourage the student’s significant adults to establish basic braille concepts. If so, how?
   5) Other___________________________

**Beginning Braille Literacy**

14. To teach the student formal reading skills in braille, you
   1) Introduce knowledge of decoding and braille word-analysis (e.g., vowel symbols, consonant symbols, or tones). If so, how?
   2) Encourage the student to develop vocabularies. If so, how?
   3) Encourage the student to write each other’s name in braille. If so, how?
   4) Ask the student to identify different braille words. If so, how?
   5) Other___________________________

15. To teach the student formal writing skills with the braillewriter, you
   1) Introduce the functions of braillewriter and correct usage. If so, how?
   2) Help the student to adjust the torso and arm/hand/finger positions while doing braillewriting tasks. If so, how?
   3) Encourage the student to freely practice typing different shapes of braille words on braille paper. If so, how?
   4) Using imitated braille learning materials to illustrate the relationship between the six numbers (one to six) and their matched key positions on braillewriter to the student. If so, how?
   5) Other___________________________
16. To provide the student an ongoing assessment of braille literacy skills, you
1) Develop a series of braille instruction processes. If so, how?
2) Cooperate with parents to ensure the student’s braille practice in home environment. If so, how?
3) Evaluate the student’s braille learning with prepared assessment equipments. If so, how?
4) Evaluate the student’s braille learning with self-designed assessment equipments. If so, how?
5) Other_____________________________________________________________

17. To continue to develop the student’s mechanical skills in braille reading, you
1) Continue the training to the student for fine motor development and finger sorting abilities. If so, how?
2) Demonstrate the concept of margin (e.g., top, bottom, left, right) and encourage the student to finger track from one margin to another. If so, how?
3) Illustrate the concept of spacing or paragraph with a authentic braille text page. If so, how?
4) Design activities for the student to practice to read the line horizontally and track rapidly down a braille page. If so, how?
5) Other_____________________________________________________________

18. To build the student’s reading fluency, you
1) Encourage the student to read braille texts aloud. If so, how?
2) Encourage the student to analyze the Zhuyin symbols when having difficulties in braille reading. If so, how?
3) Provide opportunities for the student to read in a group. If so, how?
4) Read braille texts alone with the student. If so, how?
5) Other_____________________________________________________________

19. To build the student’s motivation for reading & enjoyment of reading, you
1) Make braille students form a small reading group (no more than three students), and encourage them to read braille books together or by turns. If so, how?
2) Encourage the student to read instructions (in braille) in order to engage favorable activities (e.g., treasure hunting). If so, how?
3) Prepare braille books (in unique tactile design) available in living environment for free exploration. If so, how?
4) Design the “Story Sharing Chair” to encourage the student to sit on it for sharing the story books he or she read. If so, how?
5) Encourage parents to read braille with the students at home. If so, how?
6) Other_____________________________________________________________
20. To bridge the student’s skills from the “Beginning Braille Literacy” stage to the “Intermediate Braille Literacy” stage, you

1) Continue designing strategies to promote the student’s auditory memory (e.g., Ask the student to repeat important message that he/she just heard). If so, how?

2) Design activities to promote the student’s sensibility to the beginning and closure of sounds (e.g., listen to music and make gestures/movements according to the changes of tempo and melody). If so, how?

3) Introduce the basic formatting concepts of a braille book (e.g., the location of a page number) and fundamental knowledge of punctuations. If so, how?

4) Teach the student the mechanics of auditory devices and operations (e.g., audio tape-recorder, audio story books (in tape or CD-ROM format). If so, how?

5) Other

Reference


教師點字教學訪問題稿

請針對下列點字教學領域，具體說明您的教學經驗與策略：

• 點字讀寫蒙發

1.教導學生早期讀寫技巧和模仿技術，您會
   1) 對學生高聲朗讀。如果是，請舉例說明。
   2) 建立學生「書」的概念。如果是，請舉例說明。
   3) 鼓勵學生學習早期閱讀和寫作技巧。如果是，請舉例說明。
   4) 其他__________________________________________________________

2.若與父母/照料者攜手合作，以增廣孩子基本的讀寫概念，您會
   1) 在識字相關的活動中，與孩子從事口語互動，並且鼓勵父母也這麼做。如果是，請舉例說明。
   2) 在與識字相關的活動中，進行兩個以上大人口語的角色扮演給孩子聆聽 (例如：動物故事廣播劇)，並鼓勵家長也這麼做。如果是，請舉例說明。
   3) 確保在學校或家裡都備有書籍與書寫相關的材料。如果是，請舉例說明。
   4) 提供機會讓學生觀察其他成人 (例如：老師或家長) 從事功能性的閱讀和書寫工作 (例如：看食譜或寫採購單)，並鼓勵家長也這麼做。如果是，請舉例說明。
   5) 跟學生解釋為什麼大人重視閱讀。如果是，請舉例說明。
   6) 其他__________________________________________________________

3.為促進學生的聽覺能力的發展，您會
   1) 設計提升學生聽覺意識和注意力的活動 (例如，聆聽不同樂器的聲音)。如果是，請舉例說明。
   2) 設計促進學生聽覺記憶的活動 (例如，要求學生敘述剛才故事中提到哪些動物)。如果是，請舉例說明。
   3) 其他__________________________________________________________
4. 為發展學生的手-手指協調能力，您會
   1) 設計活動讓學生接觸不同大小形狀的物體表面及各種材質觸感。如果是，請舉例說明。
   2) 提供學生練習使用拇指、食指和中指拿小東西的機會。如果是，請舉例說明。
   3) 設計活動讓學生練習用兩手互傳物體。如果是，請舉例說明。
   4) 設計活動讓學生學習將物品定位及依序排列成直線。如果是，請舉例說明。
   5) 其他 _______________________________________________________________

5. 若要幫助父母/照料者獲得學生可讀取的學習材料（例如：點字書），您會：
   1) 在孩子識字需求方面，幫助父母建立必備的常識。如果是，請舉例說明。
   2) 提供父母相關的訊息資源，以幫助他們為孩子獲得可讀取的學習材料。如果是，請舉例說明。
   3) 其他 _______________________________________________________________

6. 為學生銜接從「點字讀寫蒙發」階段到「正式點字讀寫前期」階段的學習，您會：
   1) 在說故事時，提供跟故事內容相關的可操弄的教具（例如：填充動物娃娃）。如果是，請舉例說明。
   2) 與其他專業人員（例如：物理治療師、職能治療師、語言治療師）討論孩子的讀寫能力發展，並和他們共同合作。如果是，請舉例說明。
   3) 與其他專業人員一起討論能促進孩子讀寫能力發展的環境設計，並和他們共同合作。如果是，請舉例說明。
   4) 提供機會讓孩子幫父母和教師互傳訊息紙條（印刷體或點字）。如果是，請舉例說明。
   5) 其他 _______________________________________________________________

• 正式點字讀寫前期

7. 指導學生觸覺與動作方面的技能，您會教學生：
   1) 練習堆積木。如果是，請舉例說明。
   2) 串珠子。如果是，請舉例說明。
   3) 操作形狀分類收納盒。如果是，請舉例說明。
   4) 玩拼圖。如果是，請舉例說明。
   5) 翻開書頁。如果是，請舉例說明。
   6) 用毛線或細繩穿厚紙板上（鑽好）的孔。如果是，請舉例說明。
   7) 其他 _______________________________________________________________
8. 促進學生對點字初步的辨識能力，您會
   1) 跟學生解釋注音和字意的關係。如果是，請舉例說明。
   2) 提供學生機會去探索各種點字結構的異同。如果是，請舉例說明。
   3) 在教室的物品上用點字標示名稱(例如：桌上/座位的姓名明牌，置物櫃、玩具)。如果是，請舉例說明。
   4) 其他_____________________________________________________________________

9. 增加學生字彙的概念和能力，您會
   1) 指導學生辨識熟悉物品的名稱的起始音以及相對應的注音符號點字(例如：兔→ㄒ)。如果是，請舉例說明。
   2) 向學生介紹母音(例如：ㄚ、ㄟ、一、ㄡ、ㄨ)的構音功能及其相對應的字注音符號點字。如果是，請舉例說明。
   3) 教學生唱童謠。如果是，請舉例說明。
   4) 其他_____________________________________________________________________

10. 促進學生的聽覺能力，您會
    1) 幫助學生學習辨識環境中不同的聲音。如果是，請舉例說明。
    2) 設計能提升學生聲音定位能力的活動(例如：在老師給予口語或聲音提示的情況下，請學生走向老師，即聲源)。如果是，請舉例說明。
    3) 設計能促進學生聽覺記憶的活動(例如：請學生描述從故事錄音帶中聽到的故事內容)。如果是，請舉例說明。
    4) 要求學生口語覆述課堂討論內容。如果是，請舉例說明。
    5) 鼓勵學生相互分享生活經驗，然後在課堂上報告。如果是，請舉例說明。
    6) 幫助學生辨識注音符號點字的發音(例如：給予標示注音點字的有聲學習玩具)。如果是，請舉例說明。
    7) 其他_____________________________________________________________________

11. 促進學生點字閱讀和書寫技巧前期的發展，您會
    1) 抱著學生坐在膝前，邊念點字故事書給他/她聽，邊引導他/她的手指去摸索書上的點字。
    2) 為學生準備有聲點字故事書以供其自由翻閱。如果是，請舉例說明。
    3) 設計活動讓學生能在學校或家裡訓練手腕靈活性(例如：把不同大小的東西放進不同尺寸的有盖旋轉瓶子裡)。如果是，請舉例說明。
    4) 讓學生用準備好的材料(例如：珠子、豆子、細線、蠟筆或點字紙)做一個玩具明細表。如果是，請舉例說明。
    5) 提供點字卡、點字機和點字紙讓學生能自由摸索及模仿。如果是，請舉例說明。
    6) 其他_____________________________________________________________________

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12. 提升學生的閱讀動力並使其享受閱讀的樂趣，您會
   1) 藉由提供學生讀寫相關的學習工具（例如：紙、鉛筆、蠟筆及點字機），並使其能自由探索，以作為為學生準備一個豐富的語文學習環境。如果是，請舉例說明。
   2) 鼓勵學生跟其他視障孩子分享閱讀心得或從事其他語文活動。如果是，請舉例說明。
   3) 其他

13. 為學生銜接「正式點字讀寫前期」階段與「初步點字讀寫」階段的發展，您會
   1) 在教室環境裡，為學生擺置豐富而熟悉的日常用品。如果是，請舉例說明。
   2) 鼓勵學生跟其他人玩角色扮演的活動。如果是，請舉例說明。
   3) 鼓勵學生身邊重要的人（例如：家長或照料者）跟學生一起從事語文學習相關的活動。如果是，請舉例說明。
   4) 鼓勵學生身邊重要的人建立點字的基本概念。如果是，請舉例說明。
   5) 其他

• 初步點字讀寫

14. 教導學生正式的點字書寫技能，您會
   1) 指導學生點字的譯解和分析（例如：聲符、韻符或聲調）。如果是，請舉例說明。
   2) 鼓勵學生自己用點字造詞。如果是，請舉例說明。
   3) 鼓勵學生用點字拼寫彼此的名字。如果是，請舉例說明。
   4) 讓學生辨識不同的點字。如果是，請舉例說明。
   5) 其他

15. 指導學生用點字機正式書寫點字的技巧，您會
   1) 介紹學生點字機的功能以及正確的用法。如果是，請舉例說明。
   2) 在學生做點字功課時，幫助他/她調整軀幹及手臂/手/手指的位置。如果是，請舉例說明。
   3) 在自由活動時間，鼓勵學生在點字紙上自由練習各種不同的點字。如果是，請舉例說明。
   4) 用改良仿製的點字教材，跟學生說明點字六個點所指稱的數字，以及各數字在點字機上相對應的按鍵位置。如果是，請舉例說明。
   5) 其他
16. 在點字教學過程中，若要評估學生閱讀與點寫技巧的學習效果，您會
   1) 建立一系列的點字教學步驟。如果是，請舉例說明。
   2) 與父母緊密合作，以確保學生在家能繼續保持點字學習的效果。如果是，請舉例說明。
   3) 用過去既有的評量工具來檢測學生的點字學習效果。如果是，請舉例說明。
   4) 用自己設計的評量工具來檢測學生的點字學習效果。如果是，請舉例說明。
   5) 其他_____________________________________________________________

17. 在點字閱讀方面，為延續學生的機械性反應能力的發展，您會
   1) 繼續訓練學生在精細動作及手指在物體分類能力方面的發展。如果是，請舉例說明。
   2) 跟學生示範說明「邊」的概念（例如：頂端、底端、左、右），並鼓勵學生
   3) 舉實例跟學生講解點字文頁裡空白或段落的概念。如果是，請舉例說明。
   4) 設計活動讓學生練習用手指從左向右橫向摸讀，並能迅速往下轉換直到頁底
   5) 其他_____________________________________________________________

18.若要幫助學生能夠流利地閱讀點字，您會
   1) 鼓勵學生朗讀。如果是，請舉例說明。
   2) 當學生閱讀有困難時，鼓勵學生把注音點字分析出來。如果是，請舉例說明。
   3) 提供機會讓學生在分組中閱讀。如果是，請舉例說明。
   4) 個別與學生一起閱讀。如果是，請舉例說明。
   5) 其他_____________________________________________________________

19.提升學生的閱讀動力並使其享受閱讀的樂趣，您會
   1) 為點字摸讀學生組成一個讀書會（不超過3人），讓他們一起朗讀或輪流閱讀
   2) 鼓勵學生去閱讀（點字）指導短文，以便可以從事喜歡的活動（例如：尋寶
   3) 在日常生活環境中準備具特別觸覺設計的點字書，可供隨時閱讀。如果是，
   4) 設計「說故事寶座」以鼓勵學生坐在上面分享他/她讀過的故事書。如果是
   5) 鼓勵父母在家時跟學生一起讀點字。如果是，請舉例說明。
   6) 其他_____________________________________________________________
20. 為學生銜接「初步點字讀寫」階段與「中級點字讀寫」階段的發展，您會
    1) 繼續設計能促進學生聽覺記憶的策略 (例如：要求學生覆述剛聽到的重要訊
       息)。如果是，請舉例說明。
    2) 設計活動以提升學生對聽音的出現和結束的敏感度。(例如，隨音樂的旋律
       和節拍做不同的肢體動作)。如果是，請舉例說明。
    3) 介紹點字書的版面格式 (例如：頁數) 及標點符號的基本知識。如果是，請
       舉例說明。
    4) 教導學生聽覺輔助設備的功能和使用方法 (例如：卡匣錄音機、故事錄音帶
       或 CD-ROM)。如果是，請舉例說明。

其他 _____________________________________________________________
APPENDIX E

THE COVER LETTERS
Appendix E1: The Letter to The Program Director

March, 15, 2006

Dear Program Director:

We are conducting a study on Taiwanese teacher’s attitudes toward braille literacy and their braille literacy instruction in classroom settings. We have talked with your city/county administrators and have obtained permission to ask you to help us recruit teachers in your school for participating in the study. The letter is to introduce the study to you and to ask your permission for us to recruit teachers in your school as participants in our research.

The main purpose of the study is to explore opinions of teachers who are teaching braille to blind students in kindergarten, first and second grade levels. We are also interested in teacher’s beliefs, opinions and their strategies for braille teaching in classroom.

Participation in this study is completely voluntary and requires only the completion of an instrument, The Teachers’ Braille Training Survey. The survey includes four distinct sections: 1) teacher’s demographic information and education background; 2) their feelings of competency in, and attitudes toward, braille; 3) self-assessment of braille competency; and 4) opinions on current issues related to braille literacy. Completion of the survey should take about 15-30 minutes.

We need your help to pass out the surveys immediately to the teachers in your school who are qualified for the study (i.e., teachers who teach braille or pre-braille skills in kindergarten, first or second grade levels). They should return the completed surveys to me with the pre-paid postage seal on the surveys. All the completed surveys should be returned no later than May 15, 2006.

Teacher’s responses to the survey do not require a record of individual identity, and the returned surveys will be anonymous to ensure protection of the subjects’ privacy. All the data and information collected in the study will be handled in accordance with the goal of maintaining confidentiality. No person other than the researchers will be allowed access to the data collected for the study. Any report of findings of the study that may be publicly disseminated will safeguard against potential harm or embarrassment to any participants or institutions connected with this study.

Your assistance in this matter will be greatly appreciated. We would be interested in any input you might have on the designed instruments or the study. Please contact with either of us should you have any question or concern about this research. Thank you in advance for your support and interest.

Sincerely,

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親愛的主任/組長：

我們現在正在進行一項點字教學的研究，希望能藉此瞭解台灣視障教育老師對於點字教學的看法及態度。在跟當地主管相關單位談過之後，我們已獲得他們對本研究的認可，並得以徵詢您的意願，幫助我們在貴校尋找適合的研究對象。這封信主要的目的就是要跟您簡單介紹我們的研究。希望您看完之後，願意幫我們這個忙。

本研究的目的，主要是在探討從事學前及小學低年級視障學生教學的視障教育老師，他們本身對點字的態度。同時，我們也想知道，老師們對於點字教學的信念、看法，以及課堂上的教學策略。

這項研究的參與完全是自願性質的。在這個部分，參與的老師只要幫我們填寫這份「教師點字訓練問卷」就可以了。這份問卷包括四個部分：1）老師的教育背景；2）老師對自己點字能力的態度與看法；3）老師對自己點字能力的評估；以及4）老師對當前點字識能（讀寫的知識與能力）相關議題的看法。這份問卷預估需要 15 到 30 分鐘的時間填寫。

現在我們需要您的幫忙，就是幫我們將問卷盡快發給貴校條件符合的視障教育老師（也就是現在或曾經教過學前、國小低年級或初級點字的合格視障教學老師）。我們希望收到問卷的老師，能夠在 2006 年 5 月 15 日之前將問卷填寫好，寄回來給我們。

在寄回的問卷中，老師並不需要提供關於個人身份的訊息。回覆的問卷將會以不記名的方式紀錄，以確保參與者的隱私權。所有收集到的問卷資料，我們都會嚴守資料機密性的原則，唯有參與的研究者能閱讀本研究所收集到的資料。日後本研究結果若在學術會議或期刊論文等場合發表，必繼續執行各項保護措施，以避免研究參與者或相關機構遭受可能的傷害或羞辱。

我們非常感謝您對本研究的協助，也很樂意接受您對我們研究設計的批評和指教。若果您有任何關於本研究的疑問或關切，請您隨時跟我們聯絡。您對我們的支持與幫助，在此先向您致謝。

敬祝
教安

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電子郵件地址：ward.5@osu.edu

2006 年 3 月 15 日
Appendix E2: The Letter to The Survey Teacher

March, 15, 2006

Dear Teacher:

In Taiwan, there is very little research dealing with braille literacy and teacher training for braille instruction. Therefore, we are conducting the study: **Teachers’ Perspectives about Braille Literacy in Taiwan**, and we need your help by providing your important opinions and insights.

This survey is part of a doctoral dissertation research project designed to explore teacher’s attitudes toward braille literacy and classroom instruction in Taiwan. We have a particular interest in braille literacy instruction for young blind children. We expect to gather information from this study to understand the critical braille instruction issues in the field and their implications for teacher training program.

Enclosed please find a brief survey covering teacher demographic information, braille training, and teacher attitudes toward braille literacy. If you have taught braille or pre-braille skills to young students in kindergarten, first or second grade levels, please take 15-30 minutes out of your busy schedule to respond to this survey. After you finish the survey, you can simply fold the completed survey, staple it with the pre-paid postage seal facing out, and mail it back to me by **May 15, 2006**.

Please understand that your returning the survey will indicate your consent to participate in the study. Participation in this study is completely voluntary and you are free to select not to participate. Your responses to the survey do not require a record of individual identity, and the returned surveys will be anonymous to ensure protection of the subjects’ privacy. All the data and information collected in the study will be handled in accordance with the goal of maintaining confidentiality. No person other than the researchers will be allowed access to the data collected for the study. Any report of findings of the study that may be publicly disseminated will safeguard against potential harm or embarrassment to any participants or institutions connected with this study.

If you would prefer a braille copy of this survey, or have any question at all, please do not hesitate to contact either of us.

Your support in this study is really important to us, and we are looking forward to hearing from you soon.

~ Thank you very much for your time and attention ~

Sincerely,

Hui-Ying Hung, Doctoral Candidate  
College of Education  
The Ohio State University  
Mobile Phone No: 0927-409-597  
E-mail Address: hung.48@osu.edu

Marjorie E. Ward, Associate Professor Emerita  
College of Education  
The Ohio State University  
Phone Number: 002-1-614-451-8622  
E-mail Address: ward.5@osu.edu
Appendix E2: The Letter to The Survey Teacher

2006年3月15日

親愛的老師：

在台灣的視障教育領域裡，關於點字讀寫技能及點字教學訓練方面的研究非常稀少，因此我們設計了「台灣視障教育老師點字教學研究」這項研究計畫。現在我們需要收集您的點字訓練經驗，及對點字教學方面的見解和建議，以幫助我們透過此研究更瞭解台灣點字教學環境的現況及老師的需求。

這個研究的設計，主要是在探討台灣視障教育老師對點字識能（literacy）的態度看法，並瞭解他們在課堂上點字教學的實際狀況。在本研究中，我們對從事學前及國小低年級視障生點字教學的老師們的看法，特別感興趣。我們希望透過這個研究設計，能夠蒐集當前關於點字教學及老師點字訓練方面的資料，以瞭解目前特教界提供給視障幼童點字教學服務的狀況、師資培養及當前相關的重要議題。

本問卷設計包含教師個人教育背景、點字及點字教學訓練，以及教師對點字（讀寫）識能的看法等部份。如果您教過學前、國小一或二年級視障幼童基本點字或學前點字技能，懇請您從百忙之中抽出15到30分鐘幫我們完成這份問卷。當您填寫完這份問卷，請直接將它對折（預付郵資頁朝外），以釘書機或膠帶固定後，於2006年五月十五日前寄回。

當我們收到您寄回的問卷時，即會視您為同意參與我們的研究。參與這項研究完全屬於自願性質，您可以自由選擇參與與否。在您寄回的問卷中，並不需要提供關於個人身份的訊息。您回覆的問卷會以不記名的方式紀錄，以確保參與者的隱私權。所有收集到的問卷資料，我們都會嚴守資料機密性的原則，唯有參與的研究者能閱讀本研究所收集到的資料。日後本研究結果若在學術會議或期刊論文等場合發表，必繼續執行各項保護措施，以避免研究參與者或相關機構遭受可能的傷害或羞辱。

如果您需要點字形式的問卷版本，或者有任何疑問，請隨時與我們聯絡（台灣聯絡人：洪慧英 - 手機：0927-409-597，電話：02-8242-3648，電子郵件：hung.48@osu.edu）。

我們迫切需要您對本研究的支持，也熱切期盼早日得到您對本問卷的回應。非常感謝您寶貴的時間和關切。

敬祝

教安

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電子郵件地址：ward.5@osu.edu
Appendix E3: The Letter to The Interview Teacher

March, 15, 2006

Dear Teacher:

You may have received *The Teachers’ Braille Training Survey* to respond to our study. Now I am here to invite you to an interview which will help us to obtain more of your insights regarding braille instruction in your classroom practice.

The purpose of this one-time group interview is to investigate teacher’s teaching strategies and reflection on their practical braille and pre-braille instruction. *The Teachers’ Braille Instruction Interview Inventory* that has been included for your review will be a guideline for the interview. The inventory consists of teaching strategies and activities typical of three braille learning stages: 1) Emergent Braille Literacy; 2) Early Formal Braille Literacy, and 3) Beginning Braille literacy. Please note that this inventory will serve as a discussion guideline in the interview, and you do not need to return to us.

The postcard attached to the interview inventory should be mailed to us, if you do agree to participate in the interview. You will need to specify your contact information on the postcard so that we can contact with you regarding the meeting time and location. For those who are willing to participate in the interview, you may bring your completed *The Teachers’ Braille Training Survey* to our interview. We will also review the survey questions in the interview.

You should be aware in advance that an audio-recorder will be used in the interview to prevent missing information or misunderstanding, and your physical participation will indicate your willingness to be recorded.

Participation in this study is completely voluntary and you are free to select not to participate. All the recorded data and information collected in the study will be handled in accordance with the goal of maintaining confidentiality. The information obtained from the interview will only be analyzed and reported in a pseudonymous format. No person other than the researchers will be allowed access to the data collected for the study. Any report of findings of the study that may be publicly disseminated will safeguard against potential harm or embarrassment to any participants or institutions connected with this study.

Your support in this study is really important to us, and we are looking forward to hearing from you soon.

~ Thank you very much for your time and attention ~

Sincerely,

Hui-Ying Hung, Doctoral Candidate
College of Education
The Ohio State University
Mobile Phone No: 0927-409-597
E-mail Address: hung.48@osu.edu

Marjorie E. Ward, Associate Professor Emerita
College of Education
The Ohio State University
Phone Number: (614) 451-8622
E-mail Address: ward.5@osu.edu
親愛的老師：

日前您可能已收到一份「教師點字訓練問卷」，並開始或已完成作答。為了能更深入瞭解台灣視障教育老師點字教學的狀況，在此我們誠懇求您的協助，自願參與我們的一項訪談工作。

這個訪談的目的，是在調查老師對基本點字或學前點字預備技能的教學策略，以及相關議題的看法與建議。這份「教師點字教學訪問題稿」是訪談的內容大綱，其中問及對1）點字讀寫蒙發、2）正式點字讀寫前期，及3）初步點字讀寫三個學習階段的視障學生，您的點字教學策略與活動設計。

若您願意參與這項訪談，請將附上的回郵明信片寄回，上面填妥您的姓名及聯絡方式，以便我們通知您訪談的時間及地點。在訪談中我們也會稍事討論「教師點字訓練問卷」上的問題，所以您填妥的問卷若還未寄回，您可以將它帶來參加訪問，隨後直接交給研究者。

在此向您提醒，為避免資料遺漏或訛誤，我們在訪談中會使用數位錄音機作全程記錄。您的實地參與訪問，即被視為同意接受錄音。

這項研究的參與完全屬於自願性質，您可以自由選擇參與與否。所有錄音訊息及收集到的書面資料，都會嚴守確保資料機密性的原則。訪談中所獲得的任何資料，都會以匿名的方式統整分析及陳述。唯有參與的研究者能閱讀本研究所收集到的資料。日後本研究結果若在學術會議或期刊論文等場合發表，必繼續執行各項保護措施，以避免研究參與者或相關機構遭受可能的傷害或羞辱。

這份題稿是屆時訪談的內容大綱，先提供給您預作瀏覽。這份題稿僅供您作筆記備忘，所以並不需要填寫繳回。

您的支持對我們的研究真的非常重要。希望我們能很快收到您的回覆。

敬請教安

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APPENDIX F

THE (SURVEY) REMINDER TO

THE PROGRAM DIRECTOR
April, 27, 2006

Dear Program Director:

As you know, we are collecting data for the study of Taiwanese teacher’s attitudes toward braille literacy and their braille literacy instruction in classroom settings.

Several weeks ago, we obtained your agreement and had sent you copies of The Teachers’ Braille Training Survey in last week (April, 18, 2006). After you receive the package, please distribute the surveys to your colleagues who teach braille or pre-braille skills in kindergarten, first or second grade levels.

If you have not gotten the chance to distribute the survey, this is a reminder and please spares your precious time to do the distribution for us. If you have passed out the surveys to your colleagues who are qualified for our study, please ignore this letter.

This survey recruits teachers of students with visual impairments in all cities and counties in Taiwan to participate in the study. In Taiwan, there are very few teachers providing education services for visually impaired students; therefore, every response of the survey is valuable.

If you have any questions or suggestions, please do not hesitate to contact me. I will be very happy to answer you questions. Once again, thank you very much for your support.

Sincerely,

Hui-Ying Hung, Doctoral Candidate
College of Education
The Ohio State University
Home #: (02) 8242-3648 (Taiwan)
Mobile #: 0927-409-597
Email Address: hung.48@osu.edu
親愛的主任/組長/老師：

收信愉快。

如您所知，我現在正在收集我的博士論文「台灣視障教育老師點字教學研究」的研
究資料。

幾個禮拜前，在徵詢過您的同意後，我已經於上週（4月18日）將「教師點字訓練
問卷」寄到貴校給您，要麻煩您幫我將問卷傳發給貴校的視障教育老師（現在或
曾經教過學前、國小低年級或初級點字的視障教育老師）。

如果您因忙碌的教務工作，而還未能抽空將問卷傳送給符合我研究條件的老師，我
希望透過這封信能誠摯地給您提醒。倘若您已將問卷傳發給老師們了，則在此請接
受我的謝意。

這份問卷，係針對每個縣市在各視障教育模式中任教的視障教育老師，所做的一項
關於專業訓練的普查工作。在台灣，從事視障教育的特教老師人數本來就不多，所
以每份收回的問卷，每個回覆的答案或看法，對我們來說，都是非常珍貴的。

如果有疑問或建議，請千萬不要客氣，隨時與我聯絡，我很樂意為您做解說或意見
的溝通。再次感謝您對我們這項研究的支持。

祝
教安

博士候選人 洪慧英
俄亥俄州立大學教育學院
住宅電話：(02) 8242-3648 （台灣）
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APPENDIX G

THE RETURNED (INTERVIEW) POSTCARD
Dear Teacher:

Thank you for volunteering to participate in the interview portion of my study: Teachers’ Perspectives about Braille Literacy in Taiwan.

Please provide your contact information here so I can set up the interview meeting date/time and location with you:

Your name: Your phone number:

Your email address:

Preferred Month (circle all applicable): 2/15/06-2/28/06  3/01/06-3/15/06  3/16/06-3/31/06
4/01/06-4/15/06  4/16/06-4/30/06

Day (circle all applicable): Mon Tue Wed Thu Fri Sat Sun

Time (circle all applicable): AM PM EVENING

It is only through the responses of people like you that this study can make a vital contribution to the education of children with visual impairments. Thank you again for your assistance.

Hui-Ying Hung, M.S.
Ph.D. Candidate, College of Education, The Ohio State University
親愛的老師：

感謝您願意參與協助我們「台灣視障教育老師點字教學」的研究。請提供您的姓名、聯絡資料和適合的時間，以方便我們稍後通知您訪談的時間及地點：

<table>
<thead>
<tr>
<th>姓名：</th>
<th>聯絡電話：</th>
</tr>
</thead>
<tbody>
<tr>
<td>電子郵件地址：</td>
<td></td>
</tr>
<tr>
<td>適合期間（多選）：</td>
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</tr>
<tr>
<td>星期（多選）：</td>
<td>一 二 三 四 五 六 日</td>
</tr>
<tr>
<td>時間（多選）：</td>
<td>上午 下午 傍晚</td>
</tr>
</tbody>
</table>

唯有您的支持，我們的研究才能對視障教育領域有所貢獻。我們再次感謝您的支持與協助。

博士候選人 洪慧英
俄亥俄州立大學教育學院
APPENDIX H

THE APPROVAL NOTICE FROM THE HUMAN SUBJECTS COMMITTEE OF THE RESPONSIBLE RESEARCH PRACTICES
BEHAVIORAL/SOCIAL SCIENCES
INSTITUTIONAL REVIEW BOARD
RESEARCH INVOLVING HUMAN SUBJECTS
THE OHIO STATE UNIVERSITY

ACTION OF THE REVIEW BOARD

Research Protocol:
2006B0020 TEACHER'S PERSPECTIVES ABOUT BRAILLE LITERACY IN TAIWAN,
Marjorie E. Ward, Hui-Ying Hung, Teaching & Learning.

presented for review by the Behavioral/Social Sciences Institutional Review Board to ensure the
proper protection of rights and welfare of the individuals involved with consideration of the
methods used to obtain informed consent and the justification of risks in terms of potential benefits
to be gained.

The protocol was APPROVED by expedited review, category #7.

NOTE: The protocol was approved for non-English speaking subjects under 45 CFR 46.116 and 46.117. Human
subjects regulations (45CFR 46.116 and 46.117) require that informed consent be presented “in language
understandable to the subject” and in most situations documented in writing. The IRB requires a back translation from
the foreign language to English with verification that translation was done by an independent translator.

NOTE: Pending resolution of the above, the committee approved the waiver of documentation of informed consent
for the survey portion of the study only, in accordance with 45 CFR 46, section 117 (c)(2), as participating in
completing surveys presents no more than minimal risk to the subjects and does not involve procedures that would
normally require written consent outside of the research context.

Approval for proposed research includes all materials submitted by the investigator unless
otherwise noted.

It is the responsibility of the principal investigator to retain a copy of each signed
consent form for at least three (3) years beyond the termination of the subject’s
participation in the proposed activity. Should the principal investigator leave the
University, signed consent forms are to be transferred to the Behavioral and Social
Sciences Institutional Review Board for the required retention period. This
application has been approved for a period of not more than one year. You are
reminded that you must promptly report any problems to the Review Board, and that
no procedural changes may be made without prior review and approval. You are
also reminded that the identity of the research participants must be kept confidential.

Date: February 23, 2006  Signed: [Signature]

Chairperson

hs-025sh Behavioral approval letter (08.04)
APPENDIX I

THE TEACHERS’ RESPONSES

TO COURSES ENROLLMENT
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<th>Item</th>
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<th>Resource n = 12</th>
<th>Itinerant n = 51</th>
<th>Consultation n = 13</th>
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<td>18 94.74</td>
<td>12 100.00</td>
<td>51 100.00</td>
<td>13 100.00</td>
</tr>
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<td>40 78.43</td>
<td>10 76.92</td>
</tr>
<tr>
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<td>19 100.00</td>
<td>12 100.00</td>
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<td>12 100.00</td>
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</tr>
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| 13-42 | Communication Training | 23 | 30.26 | 5 | 26.32 | 7 | 58.33 | 12 | 23.53 | 4 | 30.77 |
| 13-43 | Implementation of Communication Aids | 17 | 22.37 | 4 | 21.05 | 4 | 33.33 | 10 | 19.61 | 3 | 23.08 |
| 13-44 | Introduction to Early Intervention | 15 | 19.74 | 3 | 15.79 | 5 | 41.67 | 7 | 13.73 | 3 | 23.08 |
| 13-45 | Teaching Methods of Early Special Education | 6 | 7.89 | 1 | 5.26 | 2 | 16.67 | 3 | 5.88 | 1 | 7.69 |
| 13-46 | Introduction to Behavioral and Emotional Disorders | 24 | 31.58 | 9 | 47.37 | 6 | 50.00 | 10 | 19.61 | 5 | 38.46 |
| 13-47 | Training of Social Skills | 15 | 19.74 | 5 | 26.32 | 4 | 33.33 | 6 | 11.76 | 2 | 15.38 |
| 13-48 | Management of Severe Behavioral Problems | 18 | 23.68 | 5 | 26.32 | 4 | 33.33 | 9 | 17.65 | 3 | 23.08 |
| 13-49 | Introduction to Autism | 28 | 36.84 | 7 | 36.84 | 6 | 50.00 | 17 | 33.33 | 6 | 46.15 |
| 13-50 | Teaching Methods to Students with Autism | 23 | 30.26 | 9 | 47.37 | 5 | 41.67 | 12 | 23.53 | 5 | 38.46 |
APPENDIX J

THE MEMORY TIPS FOR
THE ZHÙYĪN BRAILLE
The Memory Tips for The Zhùyīn Braille

By Teacher F (adopted by the original author’s approval)

- Teaching Strategies: Mental Image & Reference Association

1. Same shape and position: the usage vary by word generating conditions (10 symbols)
   1.) Consonant symbols
      ![Consonant symbols diagram]

   2.) Vowel symbols
      ![Vowel symbols diagram]

2. Same shape but different position: upper cell vs. lower cell (13 symbols)
   ![Same shape but different position diagram]
2. Same shape but different position: left vs. right, directionality (29 symbols)

3. One dot to full cell (2 symbols)

4. Missing one dot (4 symbols)

5. Un-categorical (1 symbol)
點字記憶口訣

Teacher F
(Author by Coded Name)

** 教學策略：心像法、聯想法

一、形狀位置相同，而因使用場合不同而有差異。 （10 個符號）

1. 聲母：三對雙胞胎「ㄒㄤ」、「ㄍㄐ」、「ㄑㄘ」

   ⇒ 檳榔西（ㄒ）施（ㄕ）有一位哥哥（ㄍ）喜歡吃肯得基（ㄐ），
   一天吃七（ㄑ）次（ㄘ）。

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2. 韻母：兩對雙胞胎「ㄟ、ㄧㄛ」、「ㄝ、ㄧㄢ」

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3. 綜合

   ⇒ 西邊有間龍山寺，山崖上面有「ㄝ」子，哥哥開車像飛機，
   一年七（ㄑ）次（ㄘ）修一次（ㄘ）。

A（ㄟ）到車子叫唉唷（ㄧㄛ），七（ㄑ）個禮拜修一次（ㄘ）。
二、形状相同，上下位置不同：（13个符号）

1. 悟空得到筋斗云，特别用心却头暈。

2. 被困西邊山崖上，使力挖土不心慌，

3. 日光斜照影子歪，四肢張羅傷腳踝。

4. 終於掙脫大叫「ㄘㄟ」，自治公約不再追！
三、形狀相同，左右位置相反：（29個符號）

1. 西施養了標品貓，咿鳴啊喔到處叫。

2. 小熊維尼帶身邊，愛吃肉圓跟魚眼，

3. 海苔魚酥加肉醬，放在碗裡變豆漿。

4. 右耳掛著小鈴噹，真是好笑一籮筐！

5. 肚子餓了會說「ㄥ」，嗯嗯之後會說耶！

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四、一點到六點（2個符號）

根據樹枝「」，路癡「」，三十公克「」，四次雷劈「」，五棟新房「」，六點新聞「」。

五、點字缺一方（4個符號）

1. 鴨子缺「」穿新衣，
2. 老鷹缺「」肚子餓，
3. 彎彎缺「」去爬山，
4. 偶們缺「」去廟寺，
5. 嗡嗡缺「」去跳舞，
6. 房子缺「」在斗六。

六、無法分類（1個符號）
APPENDIX K

AN EXAMPLE OF THE TWIN-VISION

BRAILLE PRINTOUT
宗旨：提供视障人士最佳点字图文阅读资料，方便图文资料之使用并提升运用之价值。