A PUBLIC BILINGUAL PREKINDERGARTEN MONTESSORI PROGRAM AND ITS IMPACT ON BRACKEN TEST LITERACY OUTCOMES: PRINCIPALS' BELIEFS ON THE RESULTS

A Dissertation Presented to the
Faculty of the College of Education
University of Houston

In Partial Fulfillment
of the Requirements for the Degree

Doctor of Education
in Professional Leadership

by

Maria Isabel Galindo

December 2014

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Dedication

I am dedicating my dissertation to my family: my husband, Jimmy, and my twin daughters, Isamar and Marisa. Jimmy thank you for your encouragement and supporting me in accomplishing my goals and dreams. To Isamar and Marisa for being my motivation in pursuing my doctoral degree, I could not have done this without the three of you. To my mother who has been proud of her children and especially in memory of my father, a wise man that instilled in all of us the value of education.

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THE IMPACT OF PUBLIC BILINGUAL PREKINDERGATEN MONTESSORI PROGRAM ON BRACKEN TEST LITERACY OUTCOMES: PRINCIPALS' BELIEFS OF ITS EFFECTIVENESS

An Abstract
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Abstract

Children who participate in high-quality prekindergarten programs with strong instructional support are more competent in early literacy skills than are children in programs with less adequate support (Hamre & Pianta, 2005). A growing concern that exists in the field of early childhood education is that a gap exists in school readiness for bilingual children in regular prekindergarten programs. In this study, the sample consisted of 600 students and two administrators. Participants attended two prekindergarten centers in a large urban district in Texas. The literacy outcomes of students who participated in a traditional bilingual prekindergarten program were compared to the literacy outcomes of students from a Montessori bilingual prekindergarten program, based on scores from the Bracken Basic Concept Scale: Expressive (BBCS:E) in 2012-2013. The scores of 300 Spanish-speaking prekindergarten students attending a Montessori bilingual program and the scores of 300 Spanish-speaking prekindergarten students attending a traditional bilingual program were compared. An independent samples *t*-test was used to compare differences in their respective mean scores on each of the subtests on the BBCS:E. A linear regression was conducted on the BBCS:E, with the bilingual education program serving as the independent variable. For the Size/Comparison, and Shapes subtests; and the School Readiness Composite Scale in the BBSC: E, the results were statistically significant, as well in the linear regression that accounted for 9.3% of the variance and reflected a

moderate effect size (Cohen, 1988), including the Numbers/Counting subtest in the linear regression. With the exception of the Colors subtest, Spanish-speaking students enrolled in the Montessori bilingual education program outperformed Spanish-speaking students enrolled in the traditional bilingual education program. From one-on-one interviews conducted with the campus principals who supported the different bilingual programs, the following themes emerged: (a) purposeful materials, (b) lesson presentation, (c) oral language, (d) exposure to literacy, and (e) letter sounds. Results of this study may inform school leaders of the effectiveness of Montessori bilingual programs in the area of school readiness. Implications for future research were: (a) using all the prekindergarten bilingual programs existing in the district involved in the study, (b) creating a testing team to test the Spanish-speaking students in the bilingual prekindergarten programs, and (c) reducing the number of days for the testing window and ensuring that window for testing is followed.

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Chapter I

Introduction

Early childhood education, prekindergarten programs, and school readiness are areas of concern in education that have been important to the educational community for a number of years. With the introduction of America 2000 in 1989 and Goals 2000 in 1994, which included eight national education goals, increased emphasis has been placed on the topic of early childhood education (Andrews & Slate, 2001). In 2014, some of these topics are still be discussed at the federal and state level.

The purpose of this study was to compare the literacy outcomes of public school prekindergarten bilingual Montessori students and students participating in a traditional bilingual prekindergarten program on the Bracken Basic Concept Scale: Expressive (BBCS:E) test. Therefore, two groups of students were a part of the investigation, a group of bilingual students who participated in the bilingual prekindergarten Montessori program and a group who participated in a traditional bilingual prekindergarten program. These two groups of students, included in this study, attended two different educational centers in a large urban school district in Texas.

Hamre and Pianta (2005) stated that children who attend high-quality prekindergarten classrooms with strong instructional supports are more competent in early literacy skills than are children in classrooms with less adequate support. Students who speak English as a second language sometimes benefit more from explicit language and literacy instruction than students who speak English as their primary language (Osborn, 2012). However, few researchers have examined whether students' early literacy skills additionally benefit from the specialized instruction in a Montessori

prekindergarten classroom environments as compared to a traditional prekindergarten classroom, especially for Spanish-speaking students.

Montessori prekindergarten programs offer a unique, child-centered approach to education and are considered high-quality programs (Dodge, 1995). Although the founder Montessori began her work with poor, special-needs children in Rome, schools today are not reserved for low-income children with disabilities. In fact, some people today think of Montessori schools as elitist institutions for wealthy families with gifted children; however, this situation is not true either. Today many private, charter, and public Montessori schools exist, catering to a variety of demographics and children's needs (Klein, 2008). The number of public Montessori schools providing a bilingual program in the United States is very limited. To be sure that a school truly practices the Montessori Method is making sure that its teachers are American Montessori Institute (AMI) or American Montessori Society (AMS) credentialed. Many Montessori schools have teachers with Montessori training (Klein, 2008). At present, a shortage exists of experienced Montessori-trained public school principals and administrators (North American Montessori Teachers' Association, 2007). Montessori school administration requires sensitivity to the needs of children from birth to adolescence. The Montessori Method requires a school administrator to understand the evolution of the school community and school culture as a whole by hiring credentialed Montessori teachers, addressing legal issues in public education, implementing parent involvement, addressing student discipline concerns, having knowledge of Montessori materials budget, and having a general knowledge of school board relations (North American Montessori Teachers' Association, 2007). The administrator must exhibit knowledge of strategic

planning and how to disaggregate data. The above named elements are critical attributes of any administrator, especially an individual who leads in a Montessori environment (Wilson, 2008).

Background of the Problem

International Ranking. The Program for International Student Assessment (PISA) is an international assessment that measures 15-year-old students' reading, mathematics, and science literacy. According to the PISA results in reading literacy, nine countries scored higher than the United States, 16 countries were not measurably different, and 39 countries had lower than average scores. No measurable change has occurred in the United States' average scores over time, and no measurable difference is present between the United States' and the Organization for Economic Co-operation and Development (OECD)'s average scores in 2000 or the scores in 2009. The mathematic scores were very similar to the reading literacy scores, with 23 countries scoring higher on average than the United States, twelve countries not measurably different, and 29 with lower than average mathematic scores (PISA, 2009).

According to the 2012 PISA, average scores in mathematics literacy ranged from 613 in Shanghai-China to 368 in Peru. The U.S. average score was 481, which was lower than the OECD average of 494. The U.S. average was lower than 29 education systems, higher than 26 education systems, and not measurably different than nine education systems. The U.S. average was lower than the states of Massachusetts (514) and Connecticut (506), but higher than Florida (467) (*PISA*, 2012).

Average scores in reading literacy ranged from 570 in Shanghai-China to 384 in Peru. The U.S. average score was 498, which was not measurably different from the

OECD average of 496. The U.S. average was lower than 19 education systems, higher than 34 education systems, and not measurably different than 11 education systems. The U.S. average was lower than the U.S. states Massachusetts (527) and Connecticut (521), but not measurably different than Florida (492) (*PISA*, 2012).

Comparing the PISA scores between 2009 and 2012 in reading, U.S. scores changed from being lower than 9 countries to being lower than 19 countries. In mathematics, U.S. scores changed from being lower than 23 countries to being lower than 29 countries. These scores reflect a trend that the U.S. is scoring lower in reading and in math each time that PISA is administrating these tests. Reading was the subject that had the biggest drop in 2012.

STAAR Test. In 2012, Texas implemented a new state test called the State of Texas Assessment of Academic Readiness (STAAR), which replaced the previous Texas Assessment of Knowledge and Skills Test (TAKS), increasing the previous test's rigor. District reports show that scores were lower than state scores in 2013. Although 71% of the third grade students met the STAAR scores in reading, only 61% of the English Language Learners (ELL) met the criteria (TAPR, 2013). State scores in reading were 81%, showing the district involved in this study is 10% points lower; in mathematics 60% of the students met the requirements in third grade, and only 54% of the ELL students met the criteria. State scores were 70% meaning 10% higher than the district involved in the study (TAPR, 2013).

The Bracken Basic Concept Scale: Expressive Test

The Bracken Basic Concept Scale: Expressive (BBCS:E) test is a standardized test developed to determine school readiness in students aged four to six. Bracken and

Panter (2009) suggested that screening young children before school entry has become common practice in school districts (B. A. Bracken & Panter, 2009). However, the district used in this study does not test students before entry school to determine readiness, but rather uses the data as a measure of student growth. In the study district, teachers administered the pre and posttest in English for Regular and English second language (ESL) students. Moreover, the test is administered in Spanish for the Spanish-speaking prekindergarten students in the bilingual program.

The BBCS:E test is comprised of ten different subtests. Part I is the School Readiness Composite (SRC) and it is composed of five subtests: identifying colors; naming letters, identifying the sounds, and producing blending; number identification; identifying sizes and making comparison; and identifying shapes. The SRC is aligned with early childhood experiences and curricula. Part II is the Expressive Total Composite (ETC) and it is about vocabulary and also includes five subtests: naming directions and positions; self-social awareness; naming textures and materials; quality; and time and sequence (B. Bracken, 2006).

Prekindergarten Programs

At the state level, prekindergarten programs in 1987 were subsidized by state or local funds in 27 states. The term prekindergarten is used to refer to a program that is an educational program for four-year-old children prior to their entrance in kindergarten. During the past two decades, public interest and investment in quality, early-childhood education programs have flourished. In 1993, approximately $1 billion in federal funding was authorized by legislation for family support and preservation programs (Andrews & Slate, 2001). Programs for children considered to be at risk had been implemented in 20

states and 7 states had programs open to all children who met age eligibility requirements (Mitchell, Seligson, & Marx, 1989). In addition to educational benefits for children who attend quality prekindergarten programs, cost-benefits have also been reported. Lewis (1993) stated that for every dollar invested in a high-quality prekindergarten program, $7.16 is saved. With the large increase in the number of prekindergarten programs, concerns about providing quality programs have increased (Andrews & Slate, 2001).

Characteristics for High-Quality Prekindergarten Programs

Researchers and educators have developed other criteria for quality programs. For example, Dodge (1995) listed five components of quality prekindergarten programs. First, quality programs are based on understanding child development and recognizing that each child is an individual with unique needs, learning styles, and interests. Second, in quality programs the children's safety and well-being are of paramount importance. Third, the physical environment of quality programs is well-organized and has a variety of age-appropriate and culturally relevant materials. Fourth, quality programs have positive and supportive relationships between staff members and families. Finally, staff members in quality programs receive ongoing training and support from the administration (Dodge, 1995).

Students who participate in quality prekindergarten programs are more likely to graduate from high school, perform better on standardized tests, less probable to repeat a grade, and less likely to require special education services. Children who attend prekindergarten have a better foundation and they are better prepared for kindergarten through grade twelve in the public school system and reduce the need for academic interventions. Researchers have demonstrated that prekindergarten education provides

students with the opportunity to have alternatives for a brighter future ("Prekindergarten in Texas," 2010).

The state program's standards are compared against a checklist of the ten research-based quality standard benchmarks for the prekindergarten programs. These ten quality benchmarks standards are: teachers have bachelor's degrees; comprehensive early learning standards; specialized training in prekindergarten instruction; assistant teachers have Child Development Associate credentials or equivalent; teachers have at least 15 hours per year of in-service training; class sizes of 20 or lower; staff-child ratio of 1:10 or better; vision, hearing, health, and one-support services; at least one meal; and regular site visits. This report shows that Texas meets only two of these standards: the early learning standards and the teacher in-service (Barnett, Carolan, Fitzgerald, & Squires, 2013).

The National Institute for Early Education Research (NIEER) has published that regular visits are necessary to ensure state policies are implemented and site visits are the best way for the state to obtain valuable feedback regarding program performance (Barnett et al., 2013). In 2012, 52 preschool programs were in 40 states and 32 state programs had an income requirement, including Texas. Texas has been ranked 28th out of 40 states on state-spending per child. Districts in Texas serve prekindergarten students who qualify by the federal income or language guidelines. The measured district's prekindergarten students are served in eight prekindergarten centers (*Prekindergarten State Law*, 2007).

Forty-two percent of nationwide children enrolled in preschool were served in programs that met fewer than half of the quality standards benchmarks. Texas is the state

with the lowest quality standards met, two out of ten on average (Barnett et al., 2013). After reviewing the checklist, the study district's prekindergarten centers meet seven out of ten of the national quality standards benchmarks.

The Montessori Program

The Montessori program was an educational program offered to young children during the time of the nursery school movement in 1892. Dr. Montessori began her career working primarily with children with mental disabilities. Eventually, she moved from working with children with mental retardation to develop an educational program for children who lived in the slums of Rome. In a Montessori classroom, the goal of early childhood education should not be to fill the child with facts from a pre-selected course of studies, but rather to cultivate each child's own natural desire to learn and absorb (Standing, 1998). A Montessori classroom is a specially designed prepared environment where the children are to be increasingly active and the teacher increasingly passive. The children direct their own lives, and, in doing so, become conscious of their own powers. In addition, the children spend most of the time working in five different areas: Language, Mathematics, Practical Life, Sensorial, and Cultural. Children in a Montessori program tend to repeat and repeat the same thing over and over again as is psychological needed (Standing, 1998). The curriculum is non-graded and non-competitive, thus allowing the children to work and grow in an environment that permits their individual potential to reach peak levels and at the children's own paces, without any negative or judgmental pressure. During this time, the children are supervised by a directress. The directress' responsibility is to be aware if what is required of the child and guide that child towards the desired goals or benchmarks. The directress' job is to be seen when

needed and unseen by those who do not need her. Directresses are trained to observe the children and present them with activities according to their individual needs; the directress is known as the dynamic link between the child and the materials in the environment (Standing, 1998). Classrooms typically include multiple age ranges as this is considered advantageous for young and old children; while the youngest learn by observing the older children, the older children learn by reinforcing what they have mastered when helping the younger children.

Statement of the Problem

This study addresses the knowledge gap about the prekindergarten Montessori bilingual program's impact by targeting two specific problems; (a) very little research is available for bilingual Montessori programs and (b) the academic impact of a public Montessori prekindergarten bilingual program on students' BBCS:E test scores as compared to scores from students attending a traditional bilingual prekindergarten program.

Purpose of the Study

The early years (zero to six years-old) are critical stages in development and learning. Dr. Montessori gave the world a practical, tested scientific method for bringing forth the very best in young human beings. She taught adults how to respect individual differences and to emphasize social interaction and the education of the whole personality rather than teaching a specific body of knowledge (Montessori, 1964). In a bilingual classroom, it is important that students receive appropriate education to close the academic gap between English speaking and Spanish speaking students. The purpose of the study was to determine if a statistically significant difference existed between

Spanish-speaking prekindergarten students attending a bilingual prekindergarten Montessori program and the Spanish-speaking prekindergarten students attending traditional bilingual prekindergarten programs. Results from this investigation may provide important data for administrators and teachers to make decisions when making recommendations to reform bilingual education in prekindergarten.

Significance of the Study

The Montessori program and its materials are currently developed only in English and were not available in Spanish until 2000 (Galindo & Rodriguez, 2000). Also, access to Montessori programs for the socio-economic status (SES), English Language Learners (ELL), and Spanish students is further limited due to few public Montessori schools. The early years (zero to six) are critical stages in development and learning, and the Primary Montessori program has been developed for children from three to five years old.

Montessori programs pay particular attention to a child's sensitive periods, using the teacher's observations to know when to introduce a particular lesson, encouraging children's freedom in learning, and offering a prepared environment. Children passing through this sensitive period tend to easily incorporate particular abilities into their schema if allowed to practice those abilities exhaustively during this time. The sensitive periods are critical to the child's self-development, both emotionally and cognitively. It is understood that during these periods a window of opportunity is present for the directress to precisely introduce a lesson that will meet each child's interest, cognitive level, and maturity. If the window is missed, the child lacks the ability to easily obtain that skill later in development. However, once the period passes, the child will have to learn the skill with much more difficulty at a later time. Adults often do not realize that a child has

sensitive periods, perhaps because they do not remember themselves and their own development. However, a thwarted sensitive period will manifest itself in a cranky child. Montessori viewed these "tantrums of the sensitive periods (as) external manifestations of an unsatisfied need" (Montessori & Costelloe, 1972, p. 41). In 1998, Humheryes highly recommended the Montessori program as a high-quality program aligned with developmentally appropriate practice.

The goal of transitional bilingual education is to help transition a student into an English-only classroom as quickly as possible. A bilingual teacher instructs children in subjects such as math, science, and social studies in their native language, so that once the transition is made to an English-only classroom, students have the knowledge necessary to compete with peers in all other subject areas. The length of time students are taught English while learning other subjects in their first language is typically three years. All instruction gradually transfers from the students' first language into English. The goals of transitional bilingual education are oral and written proficiency and academic success in English. (August & Hakuta, 1997). Researchers have documented that many of the skills learned in the native language can be transferred easily to the second language later (Irby, 2008). Tabors (1987) determined that in the early months of the school year, most second language learners had very limited communicative interactions with peers. In a bilingual classroom, it is important that students receive the appropriate education to close the gap between English speakers and bilingual students (Thomas & Collier, 1997).

Research Questions

Two sets of questions guide this study. The first set of questions is quantitative and the other set of questions is qualitative. Selected principals were interviewed for the qualitative dimension of the study.

Quantitative Research Question. One research question was quantitative in nature. Data used to answer this question were from the BBCS:E for the 2012-2013 school year. Specifically analyzed were 600 pre-test and post-test scores of Spanish-speaking students attending bilingual programs.

1. Is there a significant difference in the BBCS:E scores in the School Readiness Composite Scale between Spanish-speaking students that attended a public bilingual Montessori prekindergarten program and Spanish-speaking students who attended a traditional bilingual prekindergarten program?

Qualitative Research Questions. Three questions constituted the qualitative portion of this research investigation. Two principals were interviewed. Administrators were interviewed in the fall of 2014.

1. What are principals' insights of the effectiveness of the bilingual prekindergarten Montessori program in preparing the students for literacy/reading and math?
2. What do principals recognize as the necessary skills for English Language Learners to be fluent readers?
3. What are the areas of the BBCS:E test that principals perceive as the most important for School Readiness?

Research Design

A mixed methods research design was used to obtain, analyze, and interpret the results. For the quantitative questions, the BBCS:E test scores were obtained for 300 students who attended bilingual prekindergarten Montessori program and 300 students who attended traditional bilingual prekindergarten program. Both student groups were located in the same district and two different schools. The BBCS:E scores were analyzed and compared using the Statistical Package for the Social Science (SPSS), which is now known as IBM SPSS Statistics, to answer the research question. A linear regression method was used while analyzing the BBCS:E scores. Limitations and delimitations were taken in consideration to conclude results and summarize the findings. For the qualitative questions, two principals were interviewed to analyze their beliefs about the impact of the Montessori program on BBCS:E scores.

Theoretical Framework

Montessori Framework. The Montessori Method of education was developed in Italy by Dr. Maria Montessori in 1906 to serve disadvantage children. Her first school, Casa de Bambini, served very poor children. In describing her experience, Montessori stated:

> Sixty tearful, frightened children, so shy that it was impossible to get them to speak; their faces were expressionless, with bewildered eyes as though they had never seen anything in their lives…. Poor abandoned children who had grown up in dark tumble down cottages without anything to stimulate their minds—dejected, uncared for. (Standing, 1998, pp. 37-38)

As a medical doctor, Dr. Montessori followed the scientific method of observation, experimentation, and research to study the children. Through her research, Maria Montessori concluded that most children possess high qualities, such as:

a) Amazing mental concentration. They were able to spend long periods of time engaged in an activity when the children chose one that interested them.
b) Love of repetition. On their own, children would choose to practice things they were trying to master over and over again.
c) Love of order. Children have a natural indication for organization and orderliness.
d) Freedom of choice. Children like to choose things they do. Material must be accessible to children once the material has been introduced and the children know the intended purpose for the activity. Knowledge comes before choice.
e) Children prefer work to play. One of the greatest surprises for Dr. Montessori was the discovery that children preferred work to play because they made meaningful connections.
f) No need for reward and punishment. Children are intrinsically motivated to work if it is meaningful, challenging enough, and interesting.
g) The children refused sweets. Children often show an indifference to allurements of sweets when placed in conflict with the interest of the mind.
h) Lovers of silence. Montessori discovered that children enjoy finding out how quiet they can be. Children like to listen to silence and to soft sounds.
i) Sense of personal dignity. Children have a deep sense of personal dignity, just as adults do.

j) Desire to read and write. Dr. Montessori, at the beginning, did not believe that young children of four and five years of age should be involved in reading and writing. However, the children showed such interest that she provided some beginning materials. She was astonished by how the children seemed to "bust spontaneously into writing" (Standing, 1998, p. 47) and then reading if provided with the right materials.

Bilingual Education Framework. The Hispanic population is growing at a rapid rate. The Census Bureau reported that from 2000 to 2010 the Hispanic population group was the fastest growing of any population group in the United States (USA Census Bureau, 2010). According to the ethnicity distribution reports made by the Texas Education Agency in its 2011-2012 Academic Excellence Indicator System (AEIS), 50.8% of the students were Hispanic and 16.8% of the total population of students was identified as Limited English Proficient (LEP). Furthermore, the U.S. Department of Education (2010) has estimated that there are 5,000,000 ELL students whose primary language is Spanish (USA Census Bureau, 2010). Shifts in the population dynamics of the United States are a part of our culture and history impacting public education. For example, by the year 2030, nearly 40% of all school-age children will be ELL students (Thomas & Collier, 2002) or children for whom English is not a first language. The growth in the proportion of ELLs, particularly in regions of the country with little recent exposure to such linguistic diversity, causes educators to ask how best to meet the needs of increasingly diverse groups of students (Mikow-Porto, Humphries, Egelson, O'Connel, & Teague, 2004).

Cummins developed a bilingual Education Theoretical Framework that supports his research and findings in bilingual education. Cummins' framework contains the following major elements: the threshold hypothesis, the developmental interdependence hypothesis, the Basic Interpersonal Communication Skills (BICS), and the Cognitive-Academic Language Proficiency (CALP) dichotomy. Cummins discussed the use of sociocultural variables such as bicultural ambivalence and he analyzed the empowerment of minority students (Baral, 1987).

Krashen (1982) has developed a framework based on three approaches: theory of second language acquisition, applied linguistics research, and ideas and intuitions from experience. The theory of second-language acquisition includes several hypotheses of how language competence is developed. The first hypothesis is that language is acquired through a process similar, if not identical, to the way children develop ability in their first language. Language acquisition is a subconscious process; language acquirers are not usually aware of the fact that they are acquiring language, but are only aware of the fact that they are using the language for communication. Other ways of describing acquisition include implicit learning, informal learning, and natural learning. In non-technical terms, it just feels right; child does not necessarily know the rules or the grammatically correct way to communicate. The second hypothesis is that children develop competence in a second language by structured language learning. (Krashen, 1982).

The next part of Krashen's framework is applied linguistics research, which is not aimed at supporting or attacking any coherent theory. This experimental research is

aimed at solving practical, real problems that confront society. The results were used to compare teaching methods and groups (Krashen, 1982).

Finally, Krashen's work is based on ideas and intuitions from experience approach, which does not rely on experimentation at all. The approach relies, rather, on the insights and observations of experienced language teachers and students of foreign languages (Krashen, 1982).

Vygotsky's Theoretical Framework. Vygotsky's theoretical framework is based on the idea of the child as a social being. His view is that language is inextricably tied to cognitive and behavioral systems, interacting with them and serving their continuous development. Human beings use sign systems—including spoken language, written language, and number systems—that each society has created to satisfy communication needs (Thompson, 2000).

Vygotsky described three types of regulation in communication activities: the object-regulation, where a person is object-regulated when directly controlled by their environment; the other-regulation, when one person is regulated by another person who can influence and regulate through their position of authority, status, choice, and use of language or other behavior; and the self-regulation, where speech or spoken language is used to control one-self through self-directed utterances. Vygotsky made a distinction between learning and development. He proposed that learning is related to formal educational situation and contexts, while development happens in a less forced way. This distinction is the center of his zone of proximal development theory (Thompson, 2000).

Explained in this theory is the distinction between a child's actual development and the child's potential development. Children learn by interacting with the surrounding

culture (Thompson, 2000). In brief, Vygotsky's theory of cognitive development is that interactions with other people are essential for maximum cognitive development to occur.

Limitations and Delimitations

This study is focused on the literacy outcomes of the BBCS:E test from the students who attended a Montessori bilingual program as compared to students who attended a traditional bilingual prekindergarten program. Montessori programs are primarily offered in the private sector. Very limited information is present about public school prekindergarten Montessori programs and even less information available about bilingual prekindergarten Montessori schools. The study was limited to the selected Texas public school district that implements the Montessori and non-Montessori bilingual prekindergarten programs and only one Montessori bilingual program was compare with one traditional bilingual program. Few outside studies have been conducted to compare this study's results to due to the low participation of SES students in these kinds of programs and few outside studies are present of ELL students in Montessori programs. Additionally, some variables may affect the study due to the way the teachers administered the pre-test and post-test on a one to one basis. Furthermore, one more limitation exists; the principal researcher of this study is both, the former Montessori-certified principal of the Montessori school involved in the study and also the new principal of one of the traditional prekindergarten programs that participated in this study, which introduces potential bias.

Some safeguards were implemented to decrease bias in the analysis of the data. This first one is that the assistant principal of the traditional bilingual prekindergarten program will be interviewed instead of the principal. In addressing credibility,

investigators attempt to demonstrate that a true picture of the phenomenon under scrutiny is being presented. Shelton's (2004) principles were followed to increase the reliability of the research. To allow transferability, sufficient detail were provided on the context of the fieldwork for a reader to be able to decide whether the prevailing environment is similar to another situation with which he or she is familiar and whether the findings can justifiably be applied to the other setting. The meeting of the dependability criterion is difficult in qualitative work, although researchers should at least strive to enable a future investigator to repeat the study. Finally, to achieve confirmability, researchers must take steps to demonstrate that findings emerge from the data and not their own predispositions (Shelton, 2004). To ensure credibility, two other professionals analyzed the interview transcripts. The consistencies of the answers were examined to find patterns while comparing them.

This study is delimitated by the data only being gathered in one district, thus only the school readiness scores are taken into consideration. Also, improving early childhood education would need support at both federal and state levels. President Obama's proposal about offering prekindergarten to every child in America is meeting enthusiasm from educators and skepticism from critics; everyone agrees that before any such program can be put in place, funding must be found (Brown, 2013). That could be challenging in Texas. Texas Governor Perry recently proposed education budget cuts that would include slashing arts education, prekindergarten programs, and teacher's incentive pay as lawmakers work on fixing massive deficit with the promise of no new taxes (Perry, 2011). It is critical to support early childhood education because it is the age that children are learning the basic skills to be successful in kindergarten and later

education. Budget cuts hurt early childhood education. Despite having the largest prekindergarten enrollment in the United States, Texas has the lowest national quality standards scores—from a one to 10 range, Texas scored two in this standard evaluation (Barnett et al., 2013).

Definition of Terms

The terms used in the dissertation are presented and defined in the following sections:

- *Montessori Method* is a way of thinking and working with children. It is a philosophy that respects the unique individuality of each child and the child's process in learning of new concepts. Dr. Montessori believed in the worthiness, value, and importance of children. Her method does not compare a child to norms or standards that are measured by traditional educational systems. It is founded on the belief that children should be free to succeed and learn without restriction or criticism from anyone.
- *Transitional Bilingual Education* is an educational theory that states that children can most easily acquire fluency in a second language by first acquiring fluency in their native language (Irby, 2008).
- *English Language Learners (ELL)* as defined by the Texas Education Code, ELL are:

> The students who have a home language other than English and who are identified as an English language learner and shall be provided a full opportunity to participate in a bilingual education or a English as a second language (ESL) program, as required in the Texas Education Code (TEC), Chapter 29, as a Subchapter B (TEA).

- *Low Socio-Economic Status (LSES)* as defined by the state of Texas, LSES:

  > In 2007 Texas ranked second among all the states in the percent of its populace that was poor (that is, only four states had higher rates). The poverty rate for Texas in that year was 16.5%. The only other state that had higher poverty rates was Mississippi (20.1%). It should be pointed out that the four other states in the top five all have much smaller populations than Texas, and all are predominantly rural…. This fact alone makes Texas distinct; it clearly has the highest poverty rate of any large industrial state. (Texas Politics, 2013)

- *Sensitive Period* is a term first used by a famous Dutch biologist Hugo de Vries in connection with his research of the development of certain animals. Later it was applied by Montessori to human development. These periods of sensibility are related to certain elements in the environment towards and which the organism is directed with an irresistible impulse. That impulse serves the purpose of helping the organism acquire certain functions or determined characteristics. When this aim is accomplished, the special sensibility dies away, often to be replaced by another and quite different one (Standing, 1998).
- *Directress* is a term is in the Montessori classroom to name a teacher. This is because her primary function is not so much to teach as to direct a natural energy in the children (Standing, 1998).
- *Montessori classroom* is a prepared environment that contains more things than just tables, chairs, cupboards, and lavatories; it also has practical life materials,

sensorial materials, materials for acquiring culture, and materials for developing religious life (Standing, 1998).

- *Standardized test* is defined as a test that is administered and scored in a consistent or "standard" manner. Standardized tests are designed in such a way that the questions, conditions for administering, scoring procedures, and interpretations are consistent and are administered and scored in a predetermined, standard manner.
- *Practical Life Area* is the area with materials used to continue the process that the child has already started at home of developing control over his or her movements (P. P. Lillard, 1997).
- *Sensorial Area* is the area that helps young students to classify their sensorial impressions. Sensorial materials are related to math and reading extensions (P. P. Lillard, 1997).
- *Principal* is the primary leader in a Texas public school. This person exhibits leadership, creates and carries out a vision, and implements organizational change, dependent on his or her leadership style (Blanchard, 2007).
- *Bracken Basic Concept Scale: Expressive* (BBCS:E) consists of ten subtests examiners use to evaluate children's basic concept development.

Summary

In Chapter I, the purpose of the study was explained as the comparison of the literacy outcomes on the BBCS:E scores of 300 Spanish-speaking students who attended a public school Montessori bilingual prekindergarten versus 300 Spanish-speaking students who attended a traditional bilingual prekindergarten program. One principal

from each school participating were interviewed to find the beliefs on the success of the bilingual Montessori program. Some limitations are stated during the investigation, including the lack of Montessori bilingual programs in the public sector, the participation of the teachers providing the pre and post-test that may affect the literacy outcomes of the BBCS:E test, and the participation of the Montessori-certified former principal of the Montessori school as a principal researcher. Only two schools, from the same district, participated in the study. Some terms have been defined to understand the topic better. In Chapter II, a more extensive literature review is provided important information for making decisions when evaluating prekindergarten programs.

Chapter II

Literature Review

The purpose of this study was to compare the impact on the BBCS:E test on Montessori to non-Montessori bilingual prekindergarten programs. Also examined in this investigation were principals' beliefs of the public bilingual prekindergarten Montessori programs on the test mentioned above. The relationships between the two programs and the BBCS:E results were analyzed through use of a mixed methods research design. First, a determination needs to be made regarding the magnitude to which the bilingual Montessori program influences the results on the BBCS:E test. Second, a determination needs to be made the magnitude to which the leadership's beliefs impact these results. The following topics that were discussed below helped to guide this investigation: Early Childhood Education, History of the Montessori Program, the Montessori Approach, Montessori Training, Research on Montessori Prekindergarten Education, The History of the Bilingual Education, The Bilingual Education, The Transitional Montessori Bilingual Language Model, Early Literacy in Prekindergarten, Report of Progress, Reading Achievement and Bilingual Education, Hispanics, Low Socio-Economic Status, Transitional Bilingual Program, and the BBCS:E.

The purpose of this chapter is to outline the literature review about the historical background and the contemporary context of the Montessori program, the bilingual education programs, and the prekindergarten program. Andrew and Slate (2001) previously highlighted the importance of early childhood education, prekindergarten programs, and school readiness as areas of concern in education. Therefore, the researcher analyzed the literacy outcomes of Spanish-speaking students who attended a

public school prekindergarten bilingual program and took the BBCS:E test. Two groups of students were part of the investigation, a group of bilingual students who participated in the bilingual prekindergarten Montessori program and those who participated in a traditional bilingual prekindergarten program. The two groups of students participating attend two different educational centers in a large district in Texas.

Early Childhood Education

Some benefits exist for students attending prekindergarten. Education of young children has been a point of interest for educators since Plato and Socrates started paying attention to children. It was not until 1967 and 1973 that researchers changed the teaching focus from considering the child as learner of prepared material to a program design that produced greatest gains in the children's performance on the standardized Intellectual Coefficient (I.Q.) and readiness test (*The Early childhood curriculum*, 1992).

Researchers have established that providing a high quality education for children who attend prekindergarten prepares those students to be successful later in school and in life. Reported in the HighScope Perry Preschool Study (2005) was that adults at age 40 who had previously completed the preschool program had higher earnings, were more likely to hold a job, had committed fewer crimes, and were more likely to have graduated from high school than adults who did not have preschool. Other studies, such as The Abecedarian Project, yielded similar results. Children in quality preschool programs were less likely to repeat grades, need special education, or get into future trouble with the law. Early childhood education makes good economic sense as well. In the book, *Early Childhood Development: Economic Development with a High Public Return* (Grunewold & Rolnick, 2003), a high-ranking Federal Reserve Bank official stated that

the return on investment is about 12%, after inflation. About 1.3 million children are expected to attend public prekindergarten this fall (Hussar & Bailey, 2013). Only 52% of the four years-old students in the state of Texas attended prekindergarten in 2012-2013 because prekindergarten is not universal and students must qualify by income and/or language among other qualifications (*Prekindergarten State Law*, 2007).

History of the Montessori Program. Maria Montessori was born in Italy on August 31, 1870 in Rome, Italy. She was the first female to become a Doctor of Medicine in Italy. Her personal experiences working at the Psychiatric Clinic in the University of Rome gave her opportunity to interact with special needs students. While working with children with mental problems, she discovered that there were more pedagogical problems with these children than medical problems. During her work with children, Maria Montessori met Jean Itard and Eduard Seguin, two French doctors who had also devoted their lives to educating students with special needs. Itard was famous for his work with a boy who was found abandoned in the forest of Aveyron, a youth who was living alone in the forest for about ten years. Itard developed a methodical approach to teach the wild boy. Itard based his work on observations and experiments that led him to assume that normal human growth has developmental phases. Maria Montessori was so fascinated by Itard's work and scientific approach to learning that she decided to construct her own approach. She developed an observation method for teachers and started training them with the help of her colleagues (Standing, 1998).

Maria Montessori has been compared with Columbus; "the world that Columbus discovered was a world without: Montessori discovered a world within—within the soul of the child" (Standing, 1998 p. 35). She opened the Casa de Bambini on January 6,

1906. It was a school where only poor socioeconomic children were attending. It may be well to mention the fact that when she worked with disadvantaged children, Montessori found that the materials she made were useful to her as a means of arousing their interest (Standing, 1998). All the Montessori materials are chosen carefully and they have a direct purpose. Materials are part of a prepared environment, where children are free to choose their own work and work at their own pace.

In 1915, Maria Montessori came to the United States and delivered a speech at Carnegie Hall, and later that year she made a profound impression when she demonstrated her techniques at the Panama-Pacific Exposition in San Francisco (Standing, 1998). A wave of enthusiasm for the Montessori Method swept the United States. Many Montessori schools started operating in the United States, but after War World I, many Montessori schools were closed. It took 40 years for the Montessori schools to revive in the United States. The leader of the American revival was Nancy McCormick Rambusch, who in 1960 launched the American Montessori Society, the first—and still the largest—of several modern-era organizations supporting Montessori in America ("History of Montessori Education," 2013).

The Montessori Approach

Maria Montessori approach takes in consideration the nature of the whole child, and Montessori had a deep understanding of learning as a process. The Montessori program is organized around several periods in the child's development, and in order to meet the child's needs, it is important to create a prepared environment (Standing, 1998). That environment requires a specific training for the teacher in the classroom, including delivering lessons during instruction (Vo, 2014).

Maria Montessori described four different sensitive periods that every child goes through during their development. These sensitive periods are transitory. They are related to certain elements in the environment towards which each organism is directed with an irresistible impulse and a well-defined activity (Standing, 1998). The four sensitive periods are: the sensitive period for language, the sensitive period for order, the sensitive period for refinement of senses, and the sensitive period for learning good manners. The sensitive period of language is the most wonderful of the sensitive periods. Children learn the language without the help of reason, lessons, or conscious efforts; children learn to speak the language that they listen to every day. This is the reason that acquiring language has a national as well as an individual significance. It means that the children of any country can preserve their own nation's language. Maria Montessori said, "The adult is capable of defending his country and guarding its frontier, but it is the child who maintains its spiritual unity though its language" (Standing, 1998 p. 122).

The normal child has a different connotation in the Montessori framework. It was a children's behavior that Maria Montessori observed in the San Lorenzo more than 100 years ago. Normalization is the term used to define an observable phenomenon in a Montessori classroom, a classroom with a prepared environment and didactic materials that foster order, concentration, coordination, and independence. Montessori (1995) said that normalization is aided by children's environment, and during normalization the child shows wonderful powers, including spontaneous discipline, continuous and happy work, social sentiments of help, and sympathy for others.

The principal modification that Montessori (1988) made in the matter of school furnishing was the abolition of desks, benches, and stationary chairs. She created a

beautiful classroom that included small tables that students were able to move as needed, small chairs made of wood and a washstand for students to wash their hands. The didactic materials were displayed on cupboards. There were some plants, an aquarium, and a blackboard. The schoolroom was decorated with some attractive pictures that represented simple scenes in which children would naturally be interested (Montessori, 1988).

When furnishing a classroom, it is necessary to take into consideration some needs and concepts. First, the classroom needs to create a user-friendly environment that meets the needs of all the students. Second, the classroom should have good ambiance, where the goal is to combine the practical with the aesthetic to save the beautiful for the children. Third, the room should be developmentally appropriate with all the areas in the classroom designed to meet the child's needs. Fourth, the room must be a gathering place where parents and visitors feel welcome (Cusack & Stencel, 1999). Rodriguez (2004) calculated the start-up costs for a Montessori classroom is: (a) Montessori materials: $32,000, (b) Shelving, small tables, chairs: $6000, (c) Miscellaneous equipment and books: $1,000-$2,000, and (d) Annual maintenance for consumables: $1,000.

Lillard (1989) regarded the environment as secondary to life itself. Children grow because the potential life within each child develops and becomes visible. Second, the environment must be carefully prepared for the child by a knowledgeable and sensitive adult. Third, the adult must be a participant in the child's living and growing within the environment. Six basic components are inherent to the Montessori classroom

environment: freedom, structure and order, reality and nature, beauty and atmosphere, the Montessori materials, and the development of community life.

Montessori's materials tend to be overemphasized, but they are as important as the rest of the components. To serve their purpose of internal formation, the materials must correspond to children's' inner needs. In addition to being meaningful, there are a least five more principals for these materials. First, the difficulty or the error of the materials needs to be isolated. Second, the materials progress from simple to complex. Third, the materials are to prepare children for future learning. Fourth, the materials progress from concrete to abstract. And fifth, materials are designed for auto-education and the control of error. Children are lead in how to use the materials and permitted to recognize their own mistakes (P. P. Lillard, 1989).

Montessori materials have specific direct purposes, but at the same time they have many indirect purposes. For example, the Pink Tower has the purpose of teaching different sizes, but at the same time teachers can teach counting one to ten, stacking, and other skills. Materials have some redundancy, but the redundancy is intentional to help children master skills. In addition, each material has been developed in the context of the other materials. The Pink Tower, for example, shares some teaching concepts with other materials, such Brown Stair, Red Rods, and others (A. Lillard, 2008).

In a Montessori classroom five identified areas are present: Practical Life, Sensorial, Math, Language, and Cultural areas. The main purpose of the Exercise in the Practical Life is to assist development. Children exercising in the Practical Life area show high levels of concentration and joy. Children develop fine motor skills, such as pincer finger skills by performing daily life activities. There are many Practical Life activities

that prepare the students for reading and writing later. There are some characteristics of these activities; most of them start left to right or up to down and teach controlled movements. Children develop that movement control and eye-hand coordination to later aid them in writing (P. P. Lillard, 1989).

The Practical Life area aims at developing concentration, coordination, order, and independence. The Practical Life curriculum is divided in four main areas: Preliminaries Exercises, Care of Self, Care of the Environment, and Courtesy and Grace. These exercises are the most important for the child's whole development (Standing, 1998, p. 213).

The Language Development area involves the physiological and psychological centers in the human being. At the age of a year and half, children discover that each thing has a name. Children are able to discriminate their names and can single out concrete nouns. Children then start communicating with single-word sentences and begin alternating the order of their words (Montessori, 1995). Language continues the process of perfecting in proportion as the hearing better perceives the component sounds of the words and the psycho-motor channels become more permeable to articulation (Montessori, 1988 p. 314-315).

All the Montessori materials are related to each other. One material may be chosen to teach different concepts and at the same time, many concepts may be taught with one material. Montessori (1995) stated that the articles of mathematical precision do not occur in the little child's ordinary environment. Nature provides the child with trees, flowers and animals, but not with these. Hence the child's mathematical tendencies may

suffer from lack of opportunity, with detriment to his later process. Therefore, sensorial materials are the system of materialized abstractions, or of basic mathematics.

Some of the sensorial materials assist the child's mind through individual and concrete things to the abstract idea. It is especially obvious in the sphere of mathematics. The child works with the same materials until this sinks quietly into his mind and becomes as a part of him. Always the child works these operations in the concrete, first, until the very essence of the rule becomes absolutely clear to him (Standing, 1998).

Maria Montessori surprised the world with her discovery about reading when she noted that writing comes before reading; in fact, it comes several months before. One human being can communicate with another in this new and mysterious way without a word being spoken (Standing, 1998). Children do not read until they receive ideas from the written world. Writing prepares children for mechanically interpreting the combined sounds of the letters that compose the world which the children see written. In other words, children can read the sounds of the world (Montessori, 1972).

Even though Maria Montessori wrote many books, she did not write one about the process of reading or writing, which sometimes makes this process confusing for teachers and parents (P. P. Lillard, 1997). As the Montessori materials are related across the areas, the areas are related among themselves. It was mentioned before how the Practical Life activities support writing and reading. Also, Sensorial activities aid the process of reading and writing by discriminating shape, colors, sounds, and sizes. Language runs parallel to these activities and enhances the classroom during conversations. Vocabulary is enriched in the Montessori classroom in very unique ways. The precise use of the name of the objects in the classrooms is one of them. The development of the large

muscles also helps the students with these processes. Children start developing notions of themselves and others in the spaces in which they move (P. P. Lillard, 1989).

Colors are taught in the Montessori classroom by using three Color Tablet Boxes. Box one has six tablets; a pair of each of the primary colors (red, yellow, blue). These are the most sharply contrasted colors. Box two contains 22 tablets; a pair of each of the primary colors, the secondary colors (green, orange, purple), and also pink, brown, black, white, and grey. Box three contains 63 tablets; seven shades of nine colors: red, yellow, blue, green, orange, purple, brown, pink, and grey. Also, shapes are taught in the Montessori program by introducing three basic shapes first, using the geometric cabinet that includes 23 more shapes and the ten geometric solids (Corely, 1995).

Discipline is different in the Montessori classrooms. The prepared environment and the didactic materials play a huge role in this matter. When these components are set to meet the child's inner needs, the discipline in the classroom is not a problem. Children learn to move rather to sit, to prepare for life more than school. When freedom is discussed in the classroom, it does not mean chaos because limitations exist and the children do learn those rules. Discipline must come through liberty, and then liberty must be active. In the Montessori environment, the individual disciplined is master when the individual is able to regulate his or her own conduct. Once liberty and discipline principles are established, the prizes and external forms of punishment are not necessary. To guide a child to master the individual discipline requires a teacher who possesses a great technique to do it (Montessori, 1988).

Some of the characteristics of the Montessori lessons are the call to attention, simplicity, and objectivity. The teacher looks for indications that the child is ready and

invites the child to work with the materials; lesson must be provided individually. Words are not necessary all the time. When words are used to explain how to use the materials, the explanation should be brief. The best lesson it is the one with fewer words. They must be simple, remember that only few words are allowed. The third characteristic is the objectivity. Teacher must forget about him or herself and focus on the child and how the child shows interest on the object (Montessori, 1972).

The three-period lesson is the technique used every time that a new concept is introduced. Three steps are involved in this lesson. The first step is to associate the concrete with the abstract concept and name it. In the second step, which is the longest step, the teacher tests the child to see if the child is able to associate the abstract to the object and recognize it. The last one only happens after the child masters step two. Here, the teacher asks the child to recall and pronounce the name of the object by him or herself (P. P. Lillard, 1989).

Montessori Training

Many programs provide training for teachers to become Montessori-certified teachers. The Early Childhood Montessori Teacher Education Program is for children ages two-and-a-half through six-years old. Some programs are provided by the American Montessori Society (AMS). It is a comprehensive program that has three phases: (a) independent study, (b) academic workshop, and (c) internship. (a) Independent study is the phase that begins upon enrollment in the course. The student completes assigned reading on the principles and philosophy of Montessori Education and Child Development. The student also completes an observation report. (b) In the academic workshop, students practice with the didactic materials in the five main areas of the

Montessori classroom: Practical Life, Sensorial, Pre-Reading and Language, Pre-Math and Math, and Cultural Subjects (Botany, Zoology, Geography, Art, and Music). Lectures on Montessori Philosophy, Child Development, Classroom Management, Discipline, Psychomotor Activities, and an Intern Orientation are also included. (c) The internship lasts for nine months, during which the student observes, assists, and practices teaching in an approved Montessori classroom under the guidance of an experienced Montessori directress for a minimum of four hours a day. The student also writes monthly reports and is observed at least three times by training center personnel during the year. A research project is also developed by the student during the internship year. A mid-term exam is given in December and a final exam is given in May. When all requirements have been met, the student receives the American Montessori Society (AMS) Credential in Early Childhood (Vo, 2014).

The program requires that applicants have a minimum of High School Diploma. It is one year long and costs $6,150 per applicant. The program includes a summer training of four weeks, Monday through Saturday, 8:00 AM to 5:00 PM and one Saturday of each month starting in September, 8:00 A.M. to 5:00 P.M. (Vo, 2014).

Research on Montessori Prekindergarten Education

Research on the outcomes of Montessori education is scarce and results are inconsistent, although the varied approaches and purpose for the research do all have positive outcomes. One possible reason for the inconsistency could be variations in Montessori implementation fidelity. To determine whether outcomes vary according to implementation fidelity, Lillard (2012) examined preschool children enrolled in high-fidelity classic Montessori programs, lower-fidelity Montessori programs that

supplemented the program with conventional school activities, and, for comparison, conventional program.

Other Related Studies. Hsiao (2003) stated four purposes: (a) investigate preschool teachers' beliefs about Developmentally Appropriate Practice (DAP) and Developmentally Inappropriate Practice (DIP); (b) discover the similarities in the factor structures of the Teacher's Beliefs Scale (TBS) between the study conducted by Charlesworth, Hart, Burts, Thomasson, Mosley, and Fleege in 1993 and the current study about DAP; (c) discover the similarities and differences of DAP and DIP beliefs between Montessori teachers and preschool teachers; and (d) investigate the factors that are related to teachers' beliefs about DAP and DIP. The Teacher Beliefs Scale (TBS) was used to assess preschool teachers' beliefs about DAP and DIP. Factor analysis was used to support the validity of the TBS in the current study. Multiple independent samples *t*-tests were used to identify the differences in developmental appropriate/inappropriate beliefs between Montessori and non-Montessori teachers. Results of the study were that a majority of preschool teachers agreed with 22 Developmentally Appropriate Practices (DAP) and 12 Developmentally Inappropriate Practices (DIP). Responses to seven items were different from the original study (Charlesworth et al., 1993). A statistically significant difference was present on Inappropriate Activities and on Appropriate Child Choice between non-Montessori and Montessori teachers. A statistically significant relationship was present between teachers' beliefs about DAP and teachers' educational backgrounds, teaching experiences, ethics, and DAP understanding level in the current study (Hsiao, 2003).

Wilson (2008) had as a first purpose to determine if Montessori attendees did better than non-attendees on the four dimensions of the TPRI. The second purpose was to examine principals' and teachers' beliefs on the effectiveness of the Montessori program in preparing the prekindergarten students for kindergarten. These purposes provided quantitative and qualitative data, which was analyzed using different methods.

Wilson (2008) utilized the explanatory design of mixed methods to compare the performance in the Texas Primary Reading Inventory (TPRI) between kindergarten students who were exposed to the Montessori program and kindergarten students who were enrolled in the traditional system or non-Montessori program during their year in prekindergarten. Implications from this study were that the prekindergarten Montessori program for this specific year under study produced better-prepared kindergarten students to take the TPRI test (Wilson, 2008).

Two purposes were present in Peng's investigation. The first purpose was to examine whether or not children in an elementary school in Taiwan who had received Montessori pre-elementary education obtained significantly higher scores on tests of language arts, math, and social studies than children who attended non-Montessori pre-elementary programs. Using a one-way MANOVA as the statistical analysis, results were that Montessori-trained students had higher language arts test scores than did non-Montessori trained students. The second purpose was to determine the magnitude to which the number of years of Montessori education had a positive impact on the students' scores when they are in elementary grades (Peng, 2009).

Peng's study parallels studies in the United States where many Montessori schools claim that Montessori education yields higher academic achievement (Dohrmann,

2003). However, in comparing Peng's study to United States students, differences in Taiwan's educational system should be compared to the United States. The students in Peng's study only had prekindergarten Montessori education, because while there are many Montessori preschool and kindergarten programs in Taiwan, there are very few elementary or middle school programs. However, in the United States, most researchers analyze data on students currently performing in Montessori elementary schools and middle schools whose students had prior Montessori education since kindergarten (Peng, 2009).

Because of these differences in the education systems between Taiwan and the United States, the Taiwanese students in Peng's study did not have an opportunity to continue their Montessori education beyond kindergarten into elementary and middle schools. Therefore, Peng's study brings a mixed result as the participants were not currently receiving a Montessori education. Despite these mixed results in students' learning outcomes, the study still supported the position that Montessori prekindergarten education has had some positive influence on achievement in elementary grades (Peng, 2009).

The History of the Bilingual Education

Cerda and Hernandez (2006) described the history of bilingual education in the United States by producing a timeline of different events and court cases that have affected bilingual education. From the Colonial Era to now, bilingual education has been a great point of discussion between parents, legislators, and educators. During the Colonial Era, the first Bilingual Education School was opened. It was not a public school; it was a parochial institution. German, French, and Scandinavian immigrants

opened bilingual schools. Many of these schools were not bilingual schools; they were non-English speaking school and English was taught as a subject (Cerda & Hernandez, 2006).

In 1855, The California Bureau of Instruction mandated that all the schools teach only in English. In 1870, the school superintendent of the St. Louis school district, William Harris, argued for and promoted Bilingual Education by founding the first kindergarten taught solely in German. His intent was to give immigrant students a head start in the St. Louis school district. Between 1889 and 1891, the German instruction ceased in schools in St. Louis, San Francisco, Dt. Paul, and Louisville. In the early 1900s, a new wave of German immigrants came to the United States and the bilingual education was pushed to the front. In 1917, the United States entered World War I and anti-German sentiment prompted many schools to end German-English instruction (Cerda & Hernandez, 2006).

Several cases related to bilingual education went to court. In Meyer vs. Nebraska (1923), the court reaffirmed that only English should be taught. Later, the Lau decision (1974) guaranteed children an opportunity to a meaningful education regardless of their language background. Next, the Plyler vs. Doe case (1982) ruled that the state statute that denied undocumented children a public school education violated the 14th Amendment's equal protection clause. Finally, the Missouri vs. Jenkins (1995) case ruled that school districts did not need to demonstrate that the support services produced measurable gains for minority students who were already subjected to a history of discrimination (Cerda & Hernandez, 2006).

Bilingual Education Approach

Bilingual education means instructing children who speak limited English in their native tongue (Rossell & Baker, 1996). Several researchers describe the process of students acquiring a second language and bilingual programs available in the United States. Garcia (1983) and Hakuta (1986) determined that acquiring two languages simultaneously does not necessarily hamper the acquisition of either language. Slavin and Cheung (2004) reviewed research and contended that "bilingual education programs do not harm and in fact usually improve the English reading performance of ELLs"(p. 2). According to Schiller (2003), neuroscience research has reported that the first few years of life lay the foundation for important language skills that are necessary in the later years. "Between the fourth and eighth month of life, a child's brain will develop a native language map. A neuron will be assigned to every sound in the native language" (Schiller, 1999, p. 4). Moreover, she indicated that this wiring of the brain makes it easier for young ELL to acquire the English language.

Krashen (1982) described second language acquisition-learning distinction as the product of three different hypotheses—the natural order hypothesis, the monitor hypothesis, and the input hypothesis. The natural order hypothesis is one of the most exciting discoveries in language acquisition research. Natural order hypothesis suggests that grammatical structures are acquired in a predictable order. Some morphological forms are learned first, such as the progressive tense, plurals, regular past tense, and possessives (Krashen, 1982). The monitor hypothesis implies that formal rules, or conscious learning, play only a limited role in second language performance. Three factors play a big role in the language acquisition: time, focus on form, and knowing the

rules. The input hypothesis is important because it attempts to answer the crucial theoretical question of how we acquire language. It is also important because it may hold the answer to many everyday problems in second-language instruction at all levels. Following the discussion of the input hypothesis, we turn to the concept of the affective filter, a hypothesis as to how affective variables relate to the process of second language acquisition (Krashen, 1982).

Krashen (1982) studied emotion and language acquisition. He developed the affective filter hypothesis to describe how affective factors relate to the second-language acquisition process. The concept of an affective filter was first proposed by Dulay and Burt (1977) and it is consistent with the theoretical work in the area of affective variables and second-language acquisition (Dulay & Burt, 1977). Krashen proposed that when a learner is placed in a stressful situation where language production is demanded, the student is less likely to produce word or learn. Many researchers have conducted studies on the affective process, and their results suggest three major affective factors: motivation, self-confidence, and anxiety (Krashen, 1982).

Bilingual Education Programs

Bilingual Education programs serve children who have a language other than English in their homes and who need help learning English. These programs also benefit English-speaking children who may participate in order to become proficient in two languages. Lara-Alecio and Irby (1996) defined bilingual education as a particular school program in which students start initial steps in bilingual development (Lara-Alecio & Irby, 1996). Many different factors influence the implementation of different

programs in different states; those factors may include political reasons, the size of the population requiring the program, availability of bilingual instructors, and more.

Different types of bilingual educational programs are offered in the USA. Some of them are the transitional bilingual educational (TBE), developmental bilingual education, English as a Second Language (ESL), and immersion programs. Each of one is explained in the following paragraphs (Thomas & Collier, 1997).

Transitional bilingual programs follow either the early-exit or the late-exit bilingual program model, where instruction in the native language is diminished at a rapid or slower rate. Students in the early-exit programs move quickly into second-language use and are exited from programs by the end of second grade. The late-exit bilingual program model maintains students in the program with both languages until the end of elementary school, and students receive 40% or more of their instruction in their native language (Lara-Alecio & Irby, 1996). Lara-Alecio and Irby (1996) believed that true bilingual education should be bilingual and these models are not truly bilingual. Bilingual education should begin with the native language and advance towards the use of the second language when the teacher thinks the students are ready (Lara-Alecio & Irby, 1996).

Thomas and Collier (1997) used the name developmental bilingual education when they refer to late-exit bilingual education. Ideally, this type of program was planned for Grades K-12, but has rarely been implemented beyond the elementary school level in the United States (Thomas & Collier, 1997). Two-way bilingual education is a variation of bilingual immersion and developmental bilingual education. Language majority and language minority students are schooled together in the same bilingual

class, and they work together at all times, serving as peer teachers. Both the 90-10 and the 50-50 are two-way bilingual education models (Thomas & Collier, 1997).

English as a Second Language (ESL) programs are typically implemented in self-contained classrooms, usually for the full school day. The ESL pull-out model requires additional teacher and space, making this program the most expensive but the least effective, according to Thomas and Collier (1997). The last model is the ESL subject model. This model is less frequently implemented and requires students to attend in their native language from one to two periods of classroom instruction a day (Herrera, 2011).

Transitional Bilingual Educational Program

The bilingual program that is followed in the district in this study is the Transitional Bilingual Program (TBP), in the modality of early exit. Through the implementation of a TBP model, the district in this study's bilingual and English as a Second Language program targets the academic, linguistic, and social needs of each student whose native language is not English. Students are provided the instructional support necessary to acquire the English language and to become academically successful in the mainstream classroom.

Spanish or Vietnamese is used by bilingual-certified staff to deliver academic content so that students attain literacy in their native languages. Linguistic support is given to students whose first language is different than English, Spanish, or Vietnamese in their native language by ESL-certified teachers. Instruction in bilingual/ESL classrooms is based on the content area Texas Essential Knowledge and Skills (TEKS) and district-developed ESL curriculum guidelines. Teachers follow a district *Pacing Chart* to increase the amount of English instruction each year as commensurate with the

students' level of English proficiency. Assessment data and level of student English proficiency in listening, speaking, reading, and writing are used to meet the educational needs of each English Language Learner so that the transition to an all-English academic environment is successful (Aldine, 2013).

Transitional Montessori Bilingual Education Model

Today's society has promoted Montessori primary for exclusive private education, even though Montessori focused her initial work towards poor children. In, 2007, Shapiro indicated that of the 42 Montessori schools in the United States, not even 30 were operated in the public schools. Furthermore, Rosanova (2000) indicated that Montessori education combined with bilingual education has been virtually ignored and unexplored (Irby, Brown, Lara-Alecio, & Jackson, 2013).

Jackson (1980) conducted a study in which the purpose was twofold. He purported to describe and evaluate the first year of Montessori bilingual. This program involved 77 children in two kindergarten classrooms from two communities in central Texas. In addition, Maria Montessori's views on the nature of education, the role of the teacher, and the concepts of discipline and behavior changes are discussed and compared with views of more recent theorists. Four teachers who had been trained and certified by the Association Montessori Internationale participated in this study. They used materials and techniques developed by Maria Montessori. The evaluation of the program included language testing for comprehension and production of Spanish and English, as well as observational data from the spring and fall semesters of 1980 (Jackson, 1980).

Student pretest and posttest scores on the James Language Dominance Test showed significant improvements in English and Spanish comprehension and production.

Behavior changes observed through the use of the Coping Analysis Schedule for Educational Settings included increased percentages of time spent in self-directed activity, in paying attention to the task at hand, and in positive social interaction. Among the study's unexpected findings were (a) decreased Spanish fluency among many Mexican-American children and (b) the association of one language or the other with a particular set of materials. Program goals for the first year were met (Jackson, 1980).

Renton (1998) described Montessori's vision of young children as natural linguists and how home and school can support children's natural abilities in one or more languages. She presented five basic principles of second-language acquisition—related to educational environment, the acquisition process, components of proficiency, and cultural context and time—and describes how they can be successfully met in a Montessori environment. In her study, Renton (1998) stated that the complex multicultural and multilingual reality of America education today was affecting Montessori programs, especially in the public schools. Issues in early childhood education are of concern in an increasingly changing society. These responses include Montessori school's support for home-language maintenance and for second language, bilingual multicultural, and immersion programs whose aim is to utilize the sensitive period for language development more fully, from prekindergarten through elementary (Renton, 1988).

Rodriguez (2002) addressed two specific problems: (a) the lack of research in leading and/or implementing and maintaining a Montessori program in a bilingual setting and (b) the long-term academic impact of the prekindergarten Montessori bilingual program on primary grade students' (second grade) academic achievement as compared

to a traditional bilingual prekindergarten program. Additionally, Rodriguez explored the perspective of leaders on the implementation of a prekindergarten Montessori bilingual program. Sufficient evidence was present in the study to warrant that leaders of early childhood programs should give serious consideration to the Montessori curriculum due to the positive effects it has had on Limited English Proficiency students (Rodriguez, 2002).

Two groups of second-grade students from large, urban public school districts in Houston, Texas were evaluated for academic achievement in reading based on their participation in a prekindergarten Montessori bilingual program or a traditional bilingual prekindergarten program. Academic achievement in Spanish was assessed and the results of the independent samples *t*-test indicated that the children who had participated in a prekindergarten Montessori bilingual program significantly outscored the children who had participated in a traditional bilingual prekindergarten on the Spanish reading subtest of the Aprenda achievement test. Students who were provided with a solid foundation in their native language transferred those skills to English (Rodriguez, 2002) .

Early Literacy in Prekindergarten

The focus of this research investigation is on the Montessori program's impact on the School Readiness Composite of the BBCS:E test in prekindergarten. It is necessary to indicate that preschool children's emergent skills in the domains of oral language, phonological awareness, and print knowledge are strong and independent predictors of how quickly and how well they will read once they are exposed to formal reading instruction (Lonigan, Farver, Phillips, & Clancy-Menchetti, 2009). All these skills are highly related to reading in one way or another. In the following sections, these three

skills are discussed in detail. Despite the importance of skilled reading for academic success and growing recognition of how significantly the preschool period lays the foundation of good reading skills, few high-quality studies have been conducted of programs designed to promote the development of early literacy and other pre-academic skills (Lonigan et al., 2009).

Emergent literacy, which describes young children's reading and writing knowledge and skills acquired prior to achieving conventional literacy, provides a foundation for higher-level literacy skills. Preschool children who are experiencing difficulties in emergent literacy development are at increased risk of entering elementary school without an adequate literacy foundation. Unfortunately, children who start off slowly in literacy development rarely catch up with their peers (Juel, 1988); indicating the considerable difficulty in ameliorating literacy difficulties once they occur. The challenge for educators thus is to develop effective emergent literacy interventions to reduce this reading failure spiral (Justice & Pullen, 2003).

Oral language development is defined as the number and variety of words that children understand and the children's ability to accurately use words to convey meaning (Biemiller, 2006). Oral language skills also significantly influence reading comprehension later in elementary school (Storch & Whitehurst, 2002). Oral language involves both speaking and listening, or expressive and receptive language. Acquiring oral language is a process that requires social interaction to develop and increase vocabulary.

Phonological awareness is the ability that children have to detect larger phonological unites such as words and syllables. As their awareness deepens, they are

able to manipulate the smallest meaningful units of sounds (“Texas Guidelines,” 2008). Phonological awareness is one of the three skills involved in phonological memory; the other skills are phonological access to lexical store and phonological memory (Osborn, 2012). Children who have phonological awareness are able to identify and make oral rhymes, clap out the number of syllables in a word, and recognize words with the same initial sounds. When children interact with language in these formats, the children’s ability to respond to and play with the sounds increases. This awareness of the sounds in language, or phonological awareness, is one of the key predictors of later reading success (“Texas Guidelines,” 2008).

The term print knowledge refers broadly to children’s understanding of conventions of books and print (Zucker, Ward, & Justice, 2009), including “(1) Print as an object of meaning, (2) Book organization and print convention, (3) Alphabet knowledge, and (4) Concept word” (Zucker et al., 2009, p. 63). Children with print awareness understand that print has different functions depending on the context in which it appears; for example, menus list food choices, a book tells a story, and a sign can announce a favorite restaurant or warn of danger. Print awareness means understanding that print is organized in a particular way, such as knowing that print is read from left to right and top to bottom and knowing that words consist of letters with spaces that appear between words. Print awareness is a child's earliest introduction to literacy (“Texas Guidelines,” 2008).

Maria Montessori defined reading as the interpretation of an idea by means of graphic symbols (Montessori, 1972), such as when the child is able to recognize his or her own name, city, or the name of an object via written words and know what the word

symbols mean. She defined reading this way by suggesting that what children read in writing correspond to what they hear in speech, and therefore reading has meaning when children recognize it as another way to understand others people. Children do not read until they receive ideas from the written word (Montessori, 1972). It was not only Montessori's trust in children's powers to learn that led her to approach reading in the natural way, but also her concept of the child as an active rather a receptive being (P. P. Lillard, 1989).

Children develop the understanding of the everyday functions of print and are motivated to want to learn to read and appreciate different forms of literacy—from nonfiction and fiction books, to poems, songs, and nursery rhymes—by being read to and interacting with stories and print. It is recommended to have a minimum of five books per child in the classroom. Another factor that promotes print development is a well-planned physical room arrangement rich with environment print impacts language development and the interactions among the children. Labels with words and pictures are very important for students to make connections between written language and things that they represent ("Texas Guidelines," 2008). Achieving literacy is one of the most important milestones for young children. According to the National Research Council estimate from 1998, if children receive proper exposure and systematic opportunities to develop foundational language, reading, and emergent writing skills during early childhood as few as five percent may experience serious reading difficulties later ("Texas Guidelines," 2008).

Prekindergarten children's mathematical understandings are built on informal knowledge about that they develop even before any instruction. Young children

immediately know if someone gets more cookies than they do. They like telling their age, such as holding up four fingers to tell an adult how old they are. Children typically use quantity during play to know who scored the goal. Teachers can use this early interest in communicating math related ideas to foster greater mathematical competencies in the preschool environment. Effectively supporting mathematical competencies requires creative use of instructional tools, including play, drawing, and computer technology. The Texas Prekindergarten Guidelines are divided into these skill areas: counting, math symbols, adding and taking away, geometry, measurement, and classification and patterns("Texas Guidelines," 2008). Identifying colors are not addressed in the Prekindergarten Guidelines.

For second-language learners, the process of transfer (with literacy-based ESL and oral language beginning in prekindergarten) requires that we take what students already know and understand about in their primary language and ensure that this knowledge is used to help them gain English language and literacy skills. For students who are learning English, effective second-language reading instruction requires an understanding of and is guided by knowledge based on assessment, cultural responsiveness, gradual release, strategic use of language, and appropriate instruction. The language skills include listening and speaking, expanding both children's understanding of what they hear, as well as their ability to communicate their own ideas and experiences ("Texas Guidelines," 2008).

Report of Progress

The Report of Progress (ROP) is the instrument used in the prekindergarten program in the research district to record the students' progress every nine weeks. It

reports Language, Reading (29 letters), Mathematics (rote counting one to thirty, eleven colors, identify numbers zero to ten, and five shapes), Science, Social Studies, Fine Arts, Technology, Physical Development, Social and Emotional Development. These skills are taught, assessed and recorded in this report of progress document every nine weeks. Sizes are not assessed for this purpose ("ROP," 2012).

Reading Achievement and Bilingual Students

Reading achievement is measured with different assessments. For the purpose of this study, the impact of the Montessori bilingual prekindergarten program was assessed, using the school readiness scores from the BBCS:E test. It is important to analyze the scores of reading in different tests that are used to measure the reading level of United States students. One test is the State of Texas Assessment of the Academic Readiness (STAAR) test. Another is the National Assessment of Educational Progress (NAEP), which has been used since 1969 and is the only nationally representative, continual assessment of what American students know and can do in major academic subjects. Over the years, the NAEP has measured students' achievement in many subjects, including reading, mathematics, science, writing, history, civics, geography, and the arts. Since 1992, the current NAEP reading assessment has been given in four different years (1992, 1994, 1998, and 2000) to a nationally representative sample of fourth-grade students. NAEP provides a wealth of data about the condition of education in the United States.

Under the *No Child Left Behind* Act, as a condition of receiving federal funding, states are required to participate in the NAEP math and reading assessments for fourth- and eighth-grade students every two years, beginning in 2002-03. Resulting data will

significantly increase information that parents—and others—can use to compare the performance of children in one state with that of children in another state. To carry it one step further, NAEP data will highlight the rigor of standards and tests for individual states. If a large discrepancy is present between children's proficiency on a state's tests and their performance on NAEP, then that would suggest that the state needs to take a closer look at its standards and assessments and consider making improvements (TEA, 2013).

The STAAR replaced the Texas Assessment of Knowledge and Skills (TAKS), which is the criterion-referenced assessment program that had been in place since 2003. The STAAR started being used in the 2011-2012 school year. The new test is significantly more rigorous than the TAKS and measures a child's performance as well as academic growth. The test is administered in third to eighth grades in reading and mathematics and, by law, is linked from grade to performance expectations (TEA, 2010).

The Reading STAAR test is administrated in English and Spanish to third grade through fifth grade students. It has been modified for special education students in the same grades. The STAAR test in third grade consists of three categories: (a) Understanding across genres, where the students will demonstrate an ability to understand a variety of written tests across reading genres; (b) Understanding and analyzing literary texts, where the students will demonstrate an ability to understand and analyze literary texts; and (c) Understanding and analyzing informational texts, where the student will demonstrate an ability to understand and analyze informational texts ("STAAR Grade 3 Reading Assessment," 2011).

Performance Level Descriptors (PLDs) provide a snapshot of students' academic characteristics based on performance on a given STAAR assessment. The PLDs are statements that describe the specific knowledge and skills students typically demonstrate at each performance level. Three levels are present, Level I, Level II, and Level III, which are described in the next paragraphs.

Level III is known as advanced academic performance. At this level, the students are able to analyze a variety of literary texts by drawing conclusions about the interaction of characters and the changes they undergo. Students are able to recognize how the structural elements of literary texts affect meaning and recognize how cause-and-effect relationships are used to present ideas in expository texts. Additional, students are capable to make complex inferences within literary and informational texts, supporting those inferences with relevant textual evidence ("STAAR Reading 3 PLD," 2013).

At Level II, or satisfactory academic performance level, the students are able to determine the meaning of unfamiliar and multiple-meaning words using context, prefixes, suffixes, and roots. Students demonstrate an understanding of how the author's use of sensory language creates imagery and analyze a variety of literary texts by identifying the theme. Similarly, they are capable of determining the order and importance of the plot's main events and summarizing the plot, and describing the interaction of characters. Students must demonstrate an understanding of expository texts by identifying the author's purpose, summarizing the text in ways that maintain meaning, and using multiple text features to locate information that supports meaning and make reasonable inferences about literary and informational texts, supporting those inferences with relevant textual evidence ("STAAR Reading 3 PLD," 2013).

Level I is regarded as unsatisfactory academic performance. It is the lowest performance for a student and this level is considered failure. At this level, the students are able to determine the meaning of unfamiliar words using explicit context; demonstrate a literal understanding of literary and expository texts; and make plausible inferences about literary and expository texts ("STAAR Reading 3 PLD," 2013).

Thomas and Collier (1997) indicated that on standardized achievement tests, transitional bilingual education (TBE) is better than regular classroom instruction in only 22% of the methodologically acceptable studies when the outcome is reading, 7% of the studies when the outcome is language, and 9% of the studies when the outcome is math. The TBE is not better than structured immersion, a special program for limited English proficient children where the children are in a self-contained classroom composed solely of English learners, but the instruction is in English at a pace they can understand. Thus, transitional bilingual education is not supported by research evidence as constituting a superior form of instruction for limited English proficient children (Thomas & Collier, 1997).

For 2012-2013, the preliminary scores reported by the state of Texas were as follows: 60,552 Limited English Proficiency (LEP) students were tested and 40,835 (67%) performed at Level II; 5,342 (9%) performed at Level III; and 19,717 (33%) at Level I. The largest subgroup performing at Level I, meaning that they did not pass the test, were LEP students. Furthermore, LEP students had the lowest percent of students scoring at Level III (Texas Education Agency, 2012).

The 2012 AEIS report from the district in this study contains only TAKS information from Grades 10 through 12. In Grade 10, 91% of the students passed the test

in Language Arts at the state level. The district in the study reported that 90% of all students passed overall, and only 60% of the LEP students passed, resulting in a gap of 30% between these two subgroups (Texas Education Agency, 2012).

Mathematics and Bilingual Students

The mathematics test is administered in third to eight grades and it is linked from grade to performance expectations. This test is available in English and Spanish from third grade to fifth grade and it has been modified for special education students in the same grades. The STAAR test in third grade consists of three categories: (a) Understanding of numbers, (b) Understanding of operations, and (c) Understanding quantitative reasoning. Mathematical process skills are not assessed in isolation but are incorporated into questions that assess grade 3 content ("STAAR Math 3," 2010).

Three Performance Level Descriptors (PLDs) are present. The PLD s are statements that describe the specific knowledge and skills students typically demonstrate at each performance level. The three PLDs are: Level I, Level II, and Level III are described in the next paragraphs ("STAAR Math 3 PLD," 2013).

Level III is known as advanced academic performance. At this level, the students are able to evaluate the reasonableness of solutions to application problems involving addition and subtraction of whole numbers. Students are able to describe the relationship between related number pairs. Students are able to evaluate the reasonableness of solutions to application problems involving linear measurement ("STAAR Math 3 PLD," 2013).

Level II is known as satisfactory academic performance. Students are able to use fraction names and symbols to describe fractional parts of whole objects or sets of

objects. Students can solve application problems involving addition, subtraction, and multiplication of whole numbers and use models to solve division problems. Students are able to identify and extend patterns including related number pairs. Classify and describe attributes of two- and three-dimensional geometric figures. Students can locate and name points on a number line using whole numbers and fractions. Likewise, students are capable to solve application problems involving length and perimeter and determine time, temperature, and area using pictorial models. Solve application problems using data in pictographs and bar graphs ("STAAR Math 3 PLD," 2013).

Level I is known as unsatisfactory academic performance. At this level students can recognize fractional parts of whole objects. Students can find the value of a collection of coins and bills. Also, students are able to use models to solve addition, subtraction, and multiplication problems with whole numbers. Students can identify patterns in related multiplication and division sentences; identify patterns in related multiplication and division sentences; and identify two- and three-dimensional geometric figures, congruent figures, and lines of symmetry ("STAAR Math 3 PLD," 2013).

Tumiel (2012), in her article, explained that language is an inseparable part of mathematics. Per example one of the first lessons that parents teach their toddlers are the words to count the little fingers on their hands. Being this the beginning, for children progress to the basics of elementary school arithmetic— addition, subtraction, multiplication and division. The conventional view has been that people access mathematical concepts, such as multiplication tables, more efficiently in the language in which these were learned. Thus, for example, immigrants who spoke Spanish first and learned basic math in their native language as children turn to that language to calculate

math later in life, even if they have become proficient in another language. This view raises the question of whether bilingual individuals is at a disadvantage when they have to process math problems in their other language (Tumiel, 2012).

Low Socio-Economic Status

In Texas, the child poverty rate in 2011 was 27% while the national poverty rate was 23% (National Kids Count Data Center, 2013). Children whose family incomes are at or below the poverty level are especially likely to struggle with reading, a pattern that emerges early and strengthens in the elementary school years (Hemphill & Tivnan, 2008). Families from low socioeconomic status (SES) communities are less likely to have the financial resources or time available to provide children with academic support.

Children's initial reading competence is correlated with the home literacy environment, number of books owned, and parent's distress levels (Aikens & Barbarin, 2008). However, parents from low-SES communities may be unable to afford resources such as books, computers, or tutors to create this positive literacy environment (Orr, 2003). In a nationwide study of American kindergarten children, 36% of parents in the lowest-income quintile read to their children on a daily basis, compared with 62% of parents from the highest-income quintile (Coley, 2002). When enrolled in a program that encouraged adult support, students from low-SES groups reported higher levels of effort towards academics (Kaylor & Flores, 2008).

Although national assessments have documented modest, incremental improvements in low- income students' reading achievement over the past decade, the performance of most urban, low-income students remains below expectations (Lee, Grigg, & Donahue, 2007). Students who attend prekindergarten qualified by income

or/and language. These factors make the students who attend prekindergarten at risk of failing reading later (Hemphill & Tivnan, 2008).

Eligibility for Prekindergarten

The preschool program enrollment in Texas had a total of 227,555 students in 2012. Eighty-five percent of the districts in Texas offer preschool programs and operate a minimum of three hours per day, five days per week. Even Texas, which is ranked 33/41 in spending per child, ranks only 2/41 in total state preschool spending due to the total enrollment. A total of $753,338,055 was spent in 2012 for preschool programs (Barnett et al., 2013).

Texas Education Agency (2011) states that a child must be at least three years of age and fit at least one of the following criteria:

1. Is unable to speak and comprehend the English language.
2. Is educationally disadvantaged.
3. Is homeless, as defined by 42 U.S.C. Section 1143a, regardless of the residence of the child, of either parent of the child, or of the child's guardian or other person having lawful control of the child.
4. Is the child of an active duty member of the armed forces of the United States, including the state military forces or a reserve component of the armed forces, who is ordered to active duty by proper authority.
5. Is the child of a member of the armed forces of the United States, including the state military forces or a reserve component of the armed forces, who was injured or killed while serving on active duty.

6. Is or has been in the conservatorship of the Department of Family and Protective Services following an adversary hearing held as provided by Section 262.201, Family Code ("Eligibility for Prekindergarten," 2011).

Children qualify for a prekindergarten program by language, income, as a homeless, if parents participate in military services, and/or child under Department of Family and Protective Services (DFPS). Children must also be LEP or LSED. Students qualify for prekindergarten if they are unable to speak and comprehend the English language. Parents must complete the home language survey. The home language contains two questions and if one is answered with another language than English, the students are tested. If the results are LEP, the child qualifies for the prekindergarten program ("Eligibility for Prekindergarten," 2011).

The student qualifies if he or she is educationally disadvantaged. It means that the child is eligible to participate in the national free or reduce-price lunch program. Parents must provide written evidence of proof of income. The parents or those standing in parental relation to the student must submit documents that show income received by the household during the month prior to verification. A pay stub with no date would be insufficient. Gross income to be reported is any money received on a recurring basis, including gross earned income. Acceptable documentation for earnings (wages and salary) include: current paycheck stub, current pay envelope, letter from employer stating gross wages paid and how often they are paid, unemployment, Worker's Compensation or Disability payment stub, acceptable documentation for self-employment income, and acceptable documentation for cash income ("Eligibility for Prekindergarten," 2011).

A child may be eligible for prekindergarten if the student is homeless. Also, a child is eligible for prekindergarten if the student is the child of an active duty, injured, or killed member of the armed forces of the United States, including the state military forces or a reserved component of the armed forces ("Eligibility for Prekindergarten," 2011). A child is eligible for prekindergarten if the student is or ever has been in the conservatorship of the Department of Family and Protective Services following an adversary hearing. The parent or caregiver of the child will be mailed a verification letter of prekindergarten eligibility. Districts are asked to accept the DFPS letter as proof of eligibility to enroll these children in free prekindergarten ("Eligibility for Prekindergarten," 2011).

Young Spanish-speaking children are the largest and fastest growing ethnic minority population in the United States, representing diverse racial, linguistic, and cultural backgrounds. Educational skills and achievement lag significantly for this population, creating an unacceptable achievement gap at the beginning of kindergarten that grows even further by the end of third grade (García, 2012).

The US Census Bureau (2005) reported that Spanish-speaking children that were enrolled in early childhood education were 5.1% in 1970 and 18.6% in 2005. According to the School Readiness Surveys of the National Household Education Survey Program (2007), Spanish-speaking children, three to five years old, who were not yet enrolled in kindergarten scored the lowest when measuring school readiness skills. These reading skills included letter recognition, counting to 20 or higher, writing their name, and reading or pretending to read.

Spanish-speaking bilingual leaders need to understand and support the Spanish-speaking student population and their challenges as second-language learners. The Spanish student population is growing very fast, while Spanish-speaking educational leadership is not growing at the same speed. In this district, 5% percent of the principals are Spanish-speaking and 2% of the principals are second language learners. Also, the Spanish student population is 69.7%, while the Spanish teacher population is only 24.4% (Texas Education Agency, 2012).

Leadership Styles

The Situational Leadership Theory rests on the assumption that different situations call for different leadership skills and styles. Inherent in this theory is that a good leader will adapt his or her managerial style to the needs of the employee population under his or her leadership. According to Blanchard and Hersey (1985), four possible leadership behaviors may be employed by a manager. The behaviors can be task-focused (heavy emphasis expectations of employee), relationship-focused (heavy emphasis on the relationship between him or herself and the employee), or both as determined by employee need (Blanchard, 1985).

The Telling/Directing style of leadership is a response to follower development that is characterized by low motivation and low competence, but being unable to comply, with possible feelings of insecurity. The leader must focus highly on tasks, rather than a relationship with the employee, as a relationship does not yet exist. The leader should try to determine why the employee lacks competence and motivation. In response to these deficiencies, the leader must be task-focused but not relationship-focused so that employee expectations are clear (Blanchard, 1985).

The Selling-Coaching leadership behaviors are a response to an employee who has low competence, but fluctuating motivation. The leader should be both task- and relationship-focused so that expectations are clear, but relational support is available. They need support and praise, to build their confidence, and an involvement in decision-making, to increase their commitment (Blanchard, 1985).

Participating/Supporting is when an employee has variable motivation but high competence. The leader should take a more collaborative approach to that employee. Because employee competence is high, the leader does not need to be task-focused; however, the leader should emphasize cooperation and focus on relationship-building with that employee to engage his or her motivation (Blanchard, 1985).

Delegating/Observing leadership behaviors are reserved for the employee who is high in both competence and motivation. Because little need is present in either area, and no apparent deficiencies, the leader does not need to be very involved. Low task focus and low relationship focus in response to the employee allows the leader to concentrate his or her energies elsewhere and allows the employee to perform his or her duties autonomously (Blanchard, 1985).

Chapter III

Methodology

Research Design

This study followed a mixed methods research approach. A mixed methods research approach is "one in which the researcher uses multiple methods of data collection and analysis" (Creswell, 1994, p. 174). Specifically, it involved "between methods," drawing on both quantitative and qualitative data-collection procedures and analyses (Creswell, 1994, p. 174). Quantitative data were obtained through the BBCS:E scores of the prekindergarten students and the qualitative data through prekindergarten principal interviews. Data that were analyzed in this investigation were collected from a large, suburban district in Texas. This district provided the pre-test scores and the post-test scores of the Spanish-speaking bilingual students in the bilingual prekindergarten Montessori program and Spanish-speaking bilingual students in the traditional bilingual prekindergarten program, being the independent variable, and the gain scores in achievement on the BBCS:E test constituting the dependent variable. Two different groups were formed based upon the specific bilingual program in which students were enrolled. The results represented the scores of the students in the bilingual Montessori and the bilingual traditional prekindergarten programs.

A mixed methods research design was used due to the data that were collected to respond to the research questions. Qualitative data were based on the questions that were asked to two different principals. Quantitative data were collected from the BBCS:E test score that 600 Spanish-speaking students took at the beginning and end of the school year to compare the growth between bilingual students who were attending bilingual

prekindergarten Montessori program and traditional bilingual prekindergarten students. Combining qualitative and quantitative methods is a solid method to produce a more credible quality assurance or treatment methodology-based research program. Traditional researchers place much emphasis on a single or few methods of research outcomes and often opt to focus on just a parametric or a non-parametric approach, using the non-primary research approach to simply add details and otherwise important fillers to the research project and its final reports (Altonen, 2012).

Qualitative analysis was used to analyze the responses of administrators about their insight concerning the bilingual prekindergarten Montessori program's impact on the BBCS:E scores. Identifying themes is one of the most fundamental tasks in qualitative research after reviewing principals' responses. The techniques to identify the themes range from simple word counts that can be done by a computer to labor-intensive, line-by-line analyses that, so far, and only humans can do. There are three reasons to use techniques for discovering themes in qualitative data. First, discovering themes is the basis of much social science research. Thematic categories give investigators the tools to describe, to compare, and to explain. Second, being explicit about how to establish themes, it allows consumers of qualitative research to assess methodological choices. Third, qualitative researchers need an explicit and jargon-free vocabulary to communicate with each other across disciplines and across epistemological positions. Taping interviews, the process of identifying themes probably begins with the act of transcribing the tapes. Repetition is the easiest technique to identify themes (Ryan & Bernard, 2003). Some of the most obvious themes in a corpus of data are those "topics that occur and reoccur" (Bogdan & Taylor, 1975, p.83).

Quantitative analysis was used to compare the gain scores of the bilingual students participating in a bilingual Montessori program to the students who participate in a traditional bilingual program. Predicted in this study is that the Montessori prekindergarten program has a significant impact on school readiness. Two types of statistical analyses were conducted: linear regression analysis and independent samples t-tests.

Research Questions

As previously noted, two kinds of research questions were used, including one quantitative question and three qualitative questions: Quantitative data that were obtained and analyzed in this investigation were from the 2012-2013 school year. The qualitative data that were obtained and analyzed came from interviews that were conducted with two principals in the fall of 2014.

Quantitative Research Question. Bracken pre-test and post-test scores were used in the analysis. Data was collected from Spanish-speaking students attending two different bilingual programs, in two different schools and in the same district.

1. Is there a significant difference in the BBCS:E scores in the School Readiness Composite Scale between Spanish-speaking students that attended a public bilingual prekindergarten Montessori program and Spanish-speaking students who attended a prekindergarten traditional bilingual program?

Qualitative Research Questions. The three questions were asked to the school administrators of the two schools involved in this study. Principals were interviewed in their own campuses. A third person was asked to review the transcripts of the interviews.

1. What are principals' insights of the effectiveness of the bilingual prekindergarten Montessori program in preparing the students for literacy/reading and math?
2. What do principals recognize as the necessary skills for English Language Learners to be fluent readers?
3. What are the areas of the BBCS:E test that principals perceive as the most important for School Readiness?

Settings

Data were collected from two prekindergarten centers in a district that is located at the north of Houston, Texas. For the 2012-2013 school year the Independent School District served 65,415 students in grades EC/Pre-K to 12. The student population was 28.2% African-American, 2.4% Anglo, 2% Asian, 65.5% Hispanic, 0.2% Native American, 0.1% Native Hawaiian/Other Pacific Islander, and 1.6% Two or More Races. Low socioeconomic status is 84.8% and at-risk is 62.1%**.** Student enrollment by program comprised 6.9% (4,497) Special Education, 21.4% (14,056) Bilingual Education, 8.2% (5,386) ELL Education, 4.3% (2,833) Gifted and Talented, and 22.3% (14,580) Career and Technology Education. District personnel comprised 4,891 professional staff and 2,126 auxiliary staff, which included 3,782 teachers, 806 professional support, 225 campus administration, 78 central administration, and 877 educational aides. District staff population was 34.9% African-American, 35.6% Anglo, 2.6% Asian, 24.4% Hispanic, 23.3% male, and 76.7% female, with an average of 10.2 years of experience. The overall mobility rate for the district was approximately 19.4%, with a drop-out rate of 4.1% (Gr. 9-12). The average daily attendance rate for students was 95.5%. A total of 77,114 discipline referrals occurred this year, which is an increase of 2% from the previous year

(*TAPR*, 2013). The district in this study has 8 prekindergarten schools, 31 elementary school, 11 intermediate school, 10 middle schools, 5 ninth-grade centers, 7 high schools, and 3 alternative centers.

The Montessori Prekindergarten Center. Similar to most public school prekindergarten educational programs funded by federal funds for low-income children, the prekindergarten Montessori center had 95.8% of the children identified at poverty level. Of the 896 children on the campus, 88.4% were Hispanic, 9.7% African-American, 1% White, and 0.6% Asian. Of all the children, 68.8% were categorized as limited English proficient (LEP) and were served in bilingual classrooms (TAPR, 2013). The prekindergarten Montessori center, opened in the fall of 1998, was a result of the school district's successful passage of a 20-million-dollar bond election to support the building of four early childhood centers. The prekindergarten Montessori center was a 100,000 square-foot urban campus that housed 36 classrooms, a cafeteria, a multi-purpose room, a library, a teacher workroom, a lounge, a nurse's station, a parent workroom, a diagnostician office, a counseling room, a speech therapy room, and an office area. Each classroom was equipped with its own lavatory, drinking fountain, and sink. Twelve classrooms were in open areas and 24 classrooms were self-contained, including 8 classes in temporary buildings. Twenty-four of the classrooms were designated as bilingual classrooms. A grass-covered playground surrounded the campus. On one side of the campus was a wooded area, on another side was a large church, and on the other side was a large Hispanic flea market. The campus is situated on the corner of a busy Houston intersection.

The Traditional Prekindergarten Center. The traditional prekindergarten center opened in the fall of 1996. In 1999, it moved to a new building as a result of the school district's successful passage of a 20–million-dollar bond election to support the building of four early childhood centers. This prekindergarten center was a 100,000 square-foot urban campus that housed 36 classrooms, a cafeteria, a multi-purpose room, a library, a teacher workroom, a lounge, a nurse's station, a parent workroom, a diagnostician office, a counseling room, a speech therapy room, a special education testing center, and an office area. Each classroom was equipped with its own lavatory, drinking fountain, and sink. Twelve classrooms were in open areas, and 24 classrooms were self-contained. Fifteen of the classrooms were designated as bilingual classrooms. A grass-covered playground surrounded the campus. On one side of the campus was an intermediate school, on another side was a neighborhood houses, and on the other side was a business backyard.

Similar to most public school prekindergarten educational programs that are funded with federal funds to support low-income children, the prekindergarten center had 96.1% of the children identified at poverty level. Of the 673 children on the campus, 74.4% were Hispanic, 23% were African-American, 0.7% was White, and 1.5% was Asian. Sixty-two percent of the children were categorized as LEP, non-LEP, or special education and were served in bilingual classrooms (TAPR, 2013).

Table 1.

Student Demographics of the Two Prekindergarten Centers

Bilingual Program Type	African American	Hispanic	White	Asian	Two or more	Economically Disadvantaged	English Language Learners
Montessori	9.7%	88.4%	1%	0.6%	0.3%	95.8%	68.8%
Traditional	23%	74.4%	0.7%	1.5%	0.3%	96.1%	62%

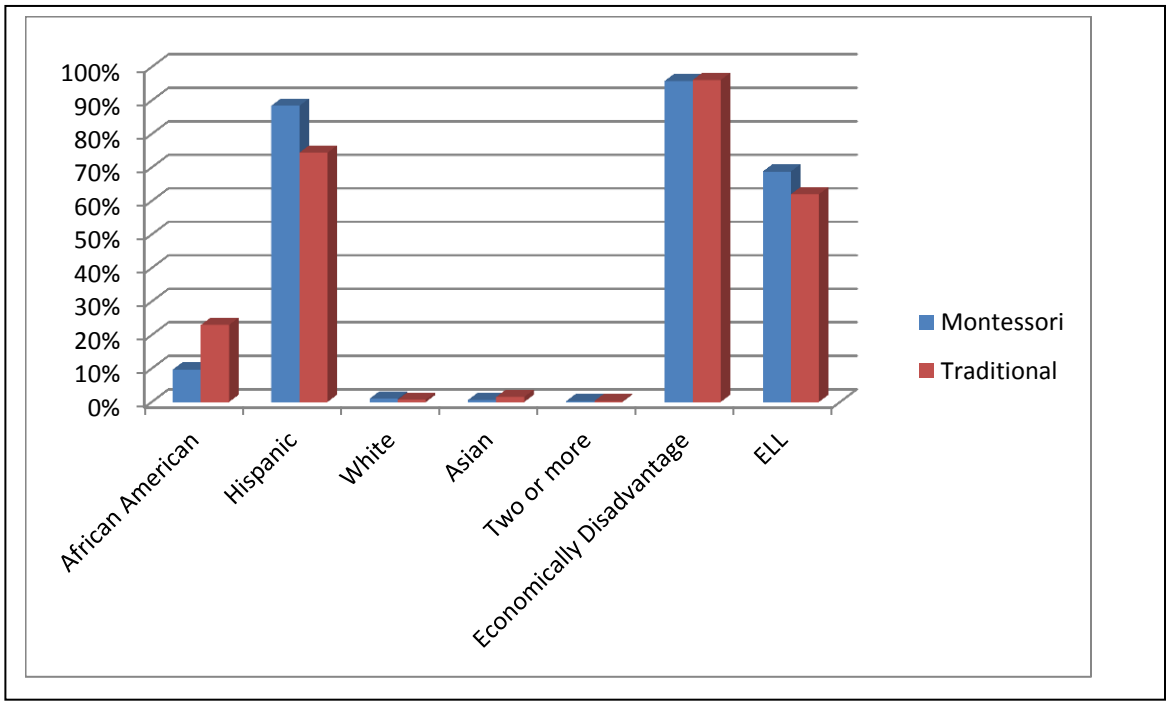

Figure 1. Student demographics of the two prekindergarten centers. There are 88.4% Hispanic of the students enrolled in the Montessori school and 68.8% are identified as ELL. In the traditional school, 74% of the students are Hispanic and 62% are identified as ELL.

Table 2.

Staff Demographics by Ethnicity, Sex, and Training

Bilingual Program Type	African American	Hispanic	White	American Indian	Male	Female	Montessori Trained
Montessori	26.2%	57.1%	16.7%	0%	2.4%	97.6%	94%
Traditional	11%	47.2%	30.6%	2.8%	0%	100%	0%

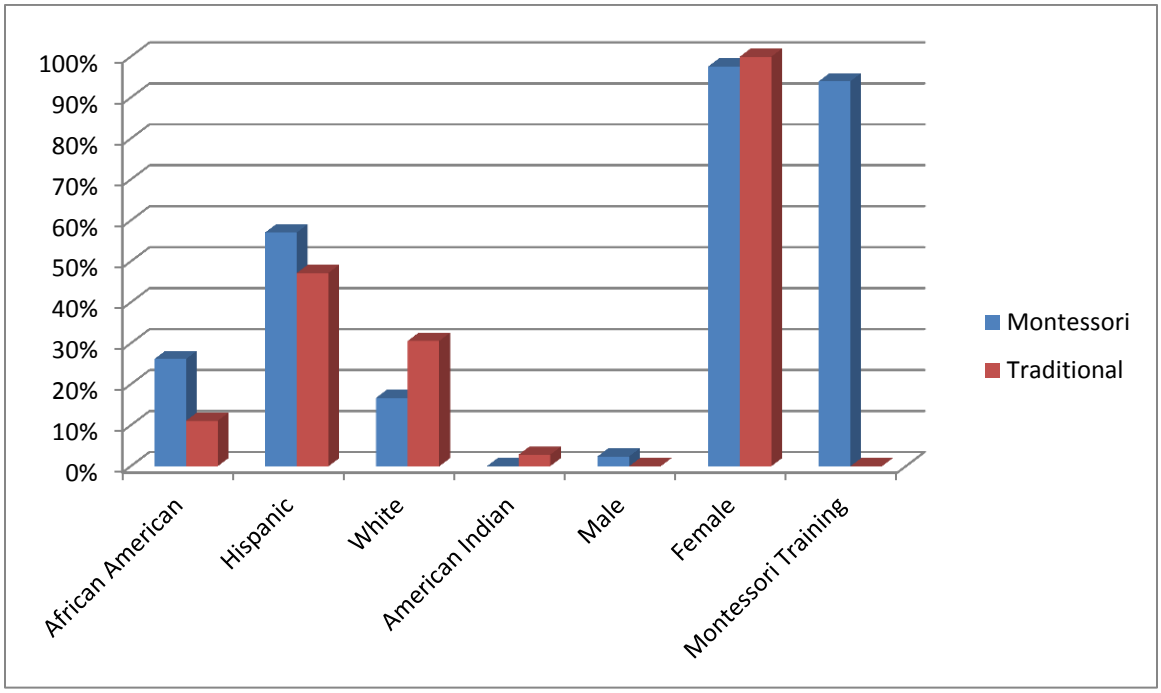

Figure 2. Staff demographics by ethnicity, sex, and training. The 94% of the teachers in the Montessori school had Montessori training, compared to 0% of Montessori-trained instructors in the traditional school.

Table 3.

Staff by Years of Experience

Bilingual Program Type	Beginning	1-5	*6-10*	*11-20*	*Over 20*
Montessori	2.4%	19.1%	47.6%	26.2%	4.8%
Traditional	2.8%	19.4%	36.1%	16.7%	25%

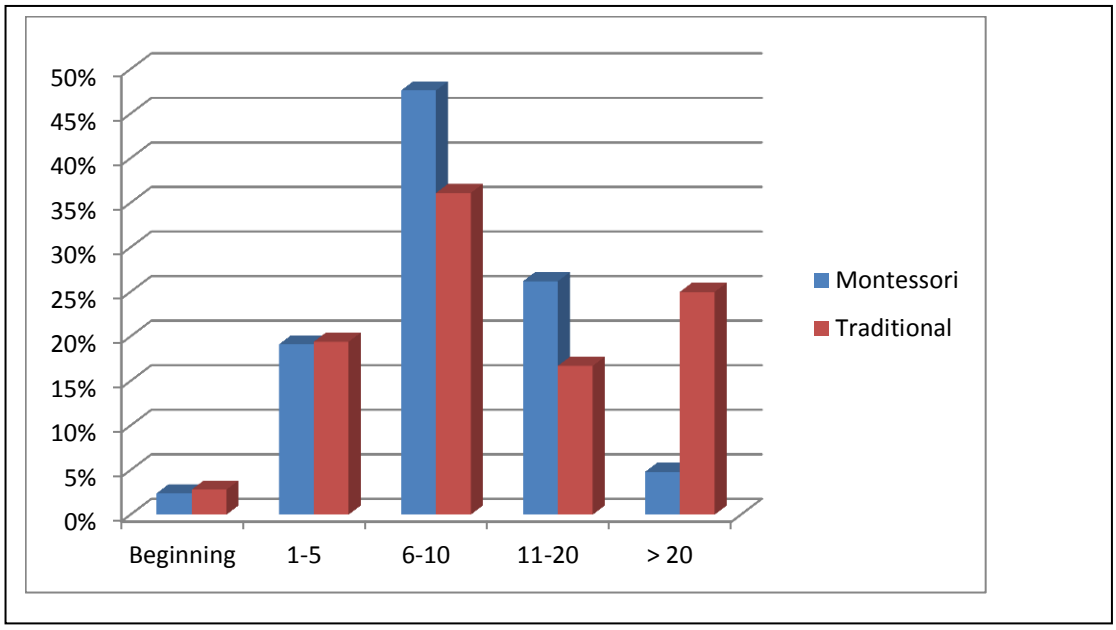

Figure 3. Staff by years of experience. The 47.6% of staff in the Montessori school had 6-10 years of experience compared to 36.1% of staff in the traditional school.

Subjects

Data were collected from two different prekindergarten centers in the same district. It included 300 bilingual prekindergarten students from four to five years old who attend classes in a Montessori prekindergarten school. Also, this study included 300 four to five year-old bilingual prekindergarten students attending a traditional prekindergarten school. All these students are Spanish speakers. All the students are born in the United States. Students were enrolled in the same large, urban school district in southeast Texas in 2012- 2013 and participated in these two prekindergarten centers.

The two leaders who were interviewed were the administrators in the two prekindergarten centers involved in the study. One leader is a bilingual principal and the other one is an English speaker assistant principal; the Montessori school's principal was a Montessori teacher in the same school for five years and it is her first year as a principal. The English speaker leader in the traditional prekindergarten school has been a leader in the school for the last five years.

Procedures

To obtain consent to analyze the data and to determine the impact of the bilingual prekindergarten Montessori in the school readiness, mainly in reading and mathematics, specific steps and procedures were followed. These steps including human subject training, the Institutional Review Board (IRB) permission to do the research, the district's approval to collect the data, and the analysis of data collected. Each step is described in detail.

Human Subjects Training. Researchers have been trained and certified by the National Institutes of Health. The University of Houston, in its written agreement with

the federal government, has indicated that it has elected to apply the same high-quality standards and requirements to all human subjects research regardless of the source of support. A certificate was issued to continue with the research ("Human Subject Research Training Requirements," 2012).

Data Collection and Data Analysis

For the purpose of this research, data were obtained from two prekindergarten centers. The archival data, collected from the 2012-2013 school year, were the BBCS:E scores of 300 Spanish-speaking prekindergarten students attending a bilingual prekindergarten Montessori program and the BBCS:E scores of the 300 Spanish-speaking prekindergarten students attending a traditional bilingual program in the same school district. These test scores were analyzed using the Statistical Package for the Social Sciences through the use of independent samples *t*-tests and linear regression procedures. The SPSS software program was used for all statistical analyses. A statistical regression analysis was used as a method to quantify the relationship between the two groups of variables. In this case, and because a relationship was examined between a scalar dependent (variable y) and one or more explanatory variables (variables x), the method was a linear regression. The Montessori program was identified as number 1 and the traditional program as number 2. These variables were used to predict the results. It was expected the students attending the bilingual Montessori program perform better than the students attending the traditional program on the BBCS:E results. The independent variables were the predictors or programs and the dependent variables were the BBCS:E scores or responses.

Interview data collection consisted of the answers that the two principals give to the questions asked. The current leader at the Montessori school was interviewed and the leader at the traditional bilingual prekindergarten was interviewed. Questions had been generated to analyze perspectives about bilingual program, the Montessori program, the BBCS:E test, and the effect of the program and test in preparing the students for school. After the answers to the questions are collected, a third person was designed to review the information to avoid biasness and increase reliability in this study.

Instruments

The data that were obtained and analyzed were the test scores that bilingual students in two different programs scored on the BBCS:E test given at the beginning and at the end of the school year. The BBCS:E consists of ten subtests examiners use to evaluate children's basic concept development. The ten subtests are colors, letter/sounds, numbers/counting, sizes/comparisons, shapes, direction/position, self/social awareness, texture/material, quantity, and time/sequence. The first five subtests comprise the School Readiness Composite (SRC) (B. Bracken, 2006). For the purpose of this study, only the five subtests that constituted the SRC subtests were analyzed and compared to determine impact. This test is available in Spanish and it was administered to bilingual students in their native language, Spanish. It assessed 10 colors, 19 letters, 19 numbers, 7 sizes, and 11 shapes.

Reliability. Anastasi and Urbina (1997) stated that the reliability of test scores depend on the accuracy, consistency, and stability of test scores across situations. Reliability refers to the consistency of scores obtained by repeatedly testing the same children on the same test under identical conditions. The reliability measure is a function

of how well the test was constructed. The reliability of the BBCS:E test was estimated using the test-retest stability (B. Bracken, 2006).

The BBCS:E was administered to 87 children—39 males and 48 females—on two separate occasions, and results were correlated and compared for mean score differences (M = 7.6, SD = 4.8) with both test administrations and the same examiners. The test-retest stability was estimated using Pearson's product-moment correlation coefficient. The average reliability coefficients are excellent (rxx > .90) for both composite scores (Expressive TC and Expressive SRC). The reliability coefficients scores for the Expressive TC were .97 and .96 for the SRC. This difference occurs because each subtest represents only a narrow portion of a child's concept knowledge. Higher reliability of composite scores happens as a consequence that composite scores are based on more items than are tested in a single subtest (B. Bracken, 2006).

Validity. The American Educational Research Association and other organizations (1999) define validity as the degree to which specific data, research, or theory support specific areas that a test measures, and that the construct or content the test purports to measure is applicable to the intended population. Validity includes evaluation of previous versions of the test, evaluation of the updated versions of the test, and research that evaluates the utility of the new measures in a variety of clinical contexts. Empirical evidence is present that the BBCS:E is designed to assess children's ability to label basic concepts verbally (Bracken, 2006).

Limitations

This study is focused in the literacy outcomes on the BBCS:E test of the students who attended a Montessori prekindergarten bilingual program compared with students

who attended a traditional bilingual prekindergarten program. The study was limited to the selected Texas public school district that implements the Montessori and non-Montessori bilingual prekindergarten programs. A limitation of this study is little available outside studies to compare this study's results to due to the low participation of SES students in these kinds of programs. Moreover, little research of ELL students is present in Montessori programs. Additionally, some variables may affect the study due to the teachers administering one to one the pre-test and post-test, such as helping students to answer the questions, not following the protocol, and more. Furthermore, there is one more limitation because the principal researcher was both the former Montessori-certified principal of the Montessori school involved in the study and the new principal of the traditional prekindergarten that participated in this study. Also, it is very challenging to test 4-year old children. Preschool children can be impulsive and say whatever is in their minds without thinking, and they can be cooperative in one minute while tired the next one. Their attention span is very short, and sometimes they get frustrated very easily (Bracken & Panter, 2009).

Some safeguards were implemented to decrease bias in the analysis of the data. In addressing credibility, investigators attempt to demonstrate that a true picture of the phenomenon under scrutiny is being presented. Shelton's (2004) principles were followed to increase the reliability of the research. To allow transferability, sufficient detail was provided in the context of the fieldwork for a reader to be able to decide whether the prevailing environment is similar to another situation with which he or she is familiar and whether the findings can justifiably be applied to the other setting. The meeting of the dependability criterion is difficult in qualitative work, although researchers

should at least strive to enable a future investigator to repeat the study. Finally, to achieve confirmability, researchers must take steps to demonstrate that findings emerge from the data and not their own predispositions (Shenton, 2004). In order to ensure trustworthiness is followed, two other professionals analyzed the transcripts of the interviews. The consistency of the answers was examined to find patterns while comparing them. Repetition was the method used to find the themes, "topics that occur and reoccur" (Bodgdan & Taylor, 1975, p. 83).

Chapter IV

Results

Introduction

In this study, the focus was on determining the magnitude to which a statistically significant difference was present between a group of Spanish-speaking students attending a bilingual prekindergarten Montessori program and a group of Spanish-speaking students attending traditional bilingual prekindergarten programs. To answer the quantitative research question, six independent samples *t*-tests and linear regression analyses were conducted to determine the magnitude to which the Montessori program were related to the BBCS:E scores. To find the relationship between principals' beliefs about the bilingual prekindergarten programs, a third person was asked to check answers and interpretations to avoid bias. The results have been split into two separate parts: one part in which the quantitative statistical findings are reported and a second part in which the qualitative findings are discussed.

Results

Quantitative Research Question. After restating the research question, the results of the independent samples *t*-tests are analyzed. Following those results, the findings from the linear regression analyzes are discussed. Results are displayed in six tables and figures.

1. Is there a significant difference in the BBCS:E scores in the School Readiness Composite Scale between Spanish-speaking students that attended a public bilingual prekindergarten Montessori program and Spanish-speaking students who attended a traditional bilingual prekindergarten program?

As noted previously, five subtests constitute the School Readiness Composite Scale. Each of these five subtests were analyzed separately to determine whether a statistically significant difference was present between the scores of Spanish-speaking students who attended a public bilingual prekindergarten Montessori program and the scores of Spanish-speaking students who attended a traditional bilingual prekindergarten program. For all results, the conventional level of .05 was used to determine the presence of a statistically significant result. For the Color subtest and for both bilingual programs, the Color pre-test score was subtracted from the Color post-test score, creating a gain score. This gain score reflects the amount of growth in this area and was used as the dependent variable. To determine whether a statistically significant difference was present in the Color subtest gain scores between students in these two bilingual programs, an independent samples *t*-test was conducted, after a check that its underlying assumptions were met. The independent samples *t*-test revealed a statistically significant difference, $t(592.01) = -2.38$, $p = .018$. As indicated in Table 4, Spanish-speaking students in the traditional bilingual program had a higher average gain score, 3.36, than did Spanish-speaking students in the Montessori bilingual program, 2.98. The effect size, Cohen's *d* was 0.20, a small effect size (Cohen, 1988).

Table 4.
Descriptive Statistics for the School Readiness Colors Subtest of the Bracken Scale by Bilingual Program Type

Bilingual Program Type	*n*	*M*	*SD*
Montessori	300	2.98	3.15
Traditional	300	3.63	3.49

The average gain score for Spanish-speaking students on the School Readiness Color subtest is depicted in Figure 4. Spanish-speaking students in the traditional bilingual prekindergarten program had a higher average gain score on this subtest than did Spanish-speaking students in the Montessori bilingual education program.

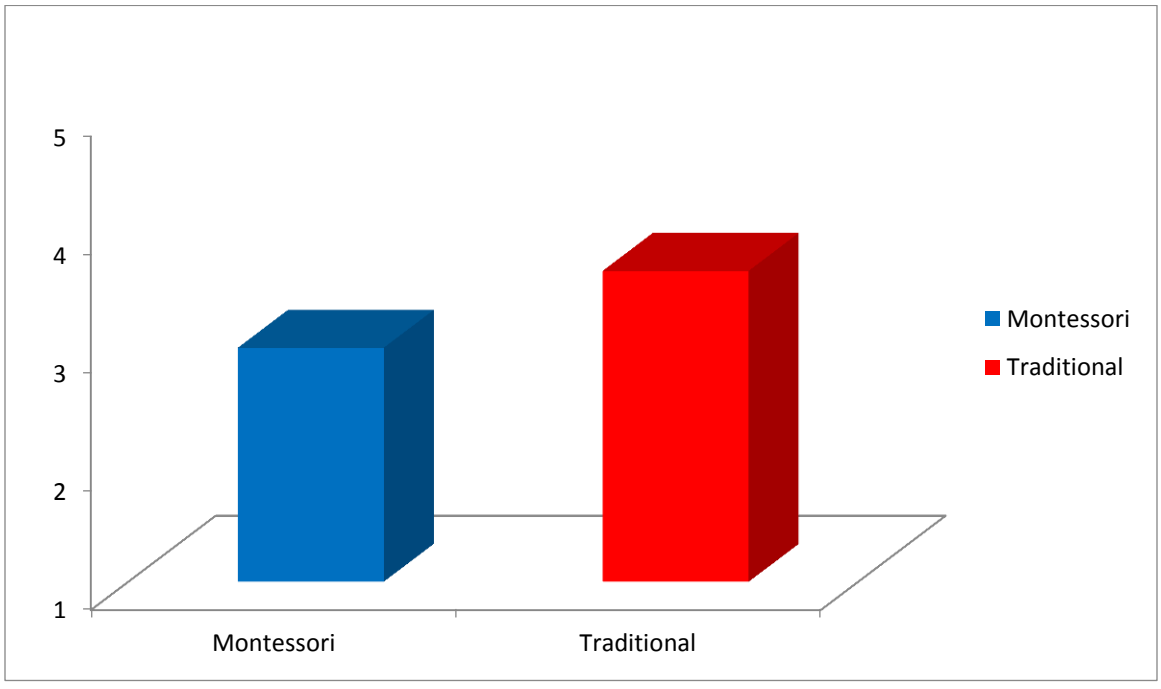

Figure 4. Average gain score on the School Readiness Colors subtest of the Bracken Scale by bilingual program type.

For the Letters/Sounds subtest and for both bilingual programs, the Letters/Sounds pre-test score was subtracted from the Letter post-test score, creating a

gain score. This gain score reflects the amount of growth in this area and was used as the dependent variable in this analysis. To determine whether a statistically significant difference was present in the Letters/Sounds subtest gain scores between students in these two bilingual programs, an independent samples *t*-test was conducted, after checks that its underlying assumptions were met. The independent samples *t*-test failed to yield a statistically significant difference, $t(595.52) = 1.84$, $p = .066$, at the conventional alpha level of .05. As revealed in Table 5, though not statistically significant, Spanish-speaking students in the Montessori bilingual program had a slightly higher average gain score, 12.58, than did Spanish-speaking students in the traditional bilingual prekindergarten program, 11.93.

Table 5.
Descriptive Statistics for the School Readiness Letters/Sounds Subtest of the Bracken Scale by Bilingual Program Type

Bilingual Program Type	*n*	*M*	*SD*
Montessori	300	12.58	4.45
Traditional	300	11.93	4.17

The average gain score for Spanish-speaking students on the School Readiness Letters/Sounds subtest is depicted in Figure 5. In this analysis, Spanish-speaking students in the Montessori bilingual education program had a higher average gain score on this subtest than did Spanish-speaking students in the traditional bilingual prekindergarten program.

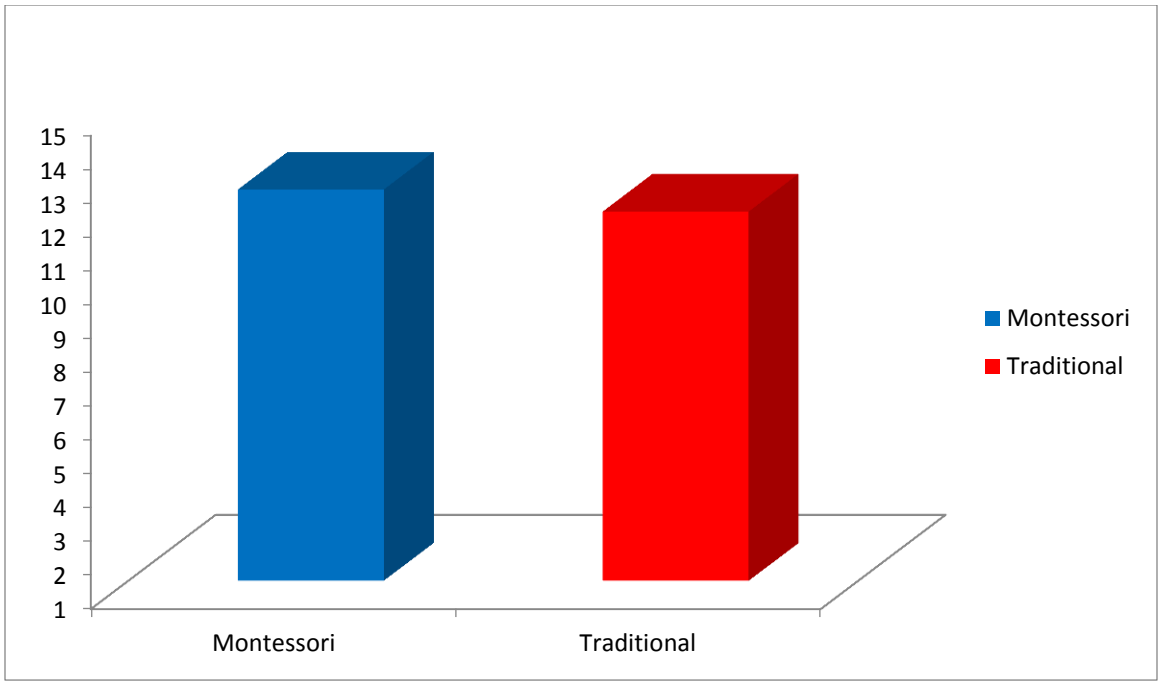

Figure 5. Average gain score on the School Readiness Letters/Sounds subtest of the Bracken Scale by bilingual program type.

For the Numbers/Counting subtest and for both bilingual programs, the Number/Counting pre-test score was subtracted from the Numbers/Counting post-test score, creating a gain score. This gain score reflects the amount of growth in this area and was used as the dependent variable in this analysis. To determine whether a statistically significant difference was present in the Numbers/Counting subtest gain scores between students in these two bilingual programs, an independent samples *t*-test was conducted, after checks that its underlying assumptions were met. The independent samples *t*-test did not reveal a statistically significant difference, $t(594.23) = 0.36$, $p = .716$. As delineated in Table 6, though not statistically significant, Spanish-speaking students in the Montessori bilingual program had a slightly higher average gain score, 10.04, than did Spanish-speaking students in the traditional bilingual prekindergarten program, 9.93.

Table 6.
Descriptive Statistics for the School Readiness Number/Counting Subtest of the Bracken Scale by Bilingual Program Type

Bilingual Program Type	*n*	*M*	*SD*
Montessori	300	10.04	3.55
Traditional	300	9.93	3.85

The average gain score for Spanish-speaking students on the School Readiness Numbers/Counting subtest is depicted in Figure 6. Similar to the previous analysis, Spanish-speaking students in the Montessori bilingual education program had a higher average gain score on this subtest than did Spanish-speaking students in the traditional bilingual prekindergarten program.

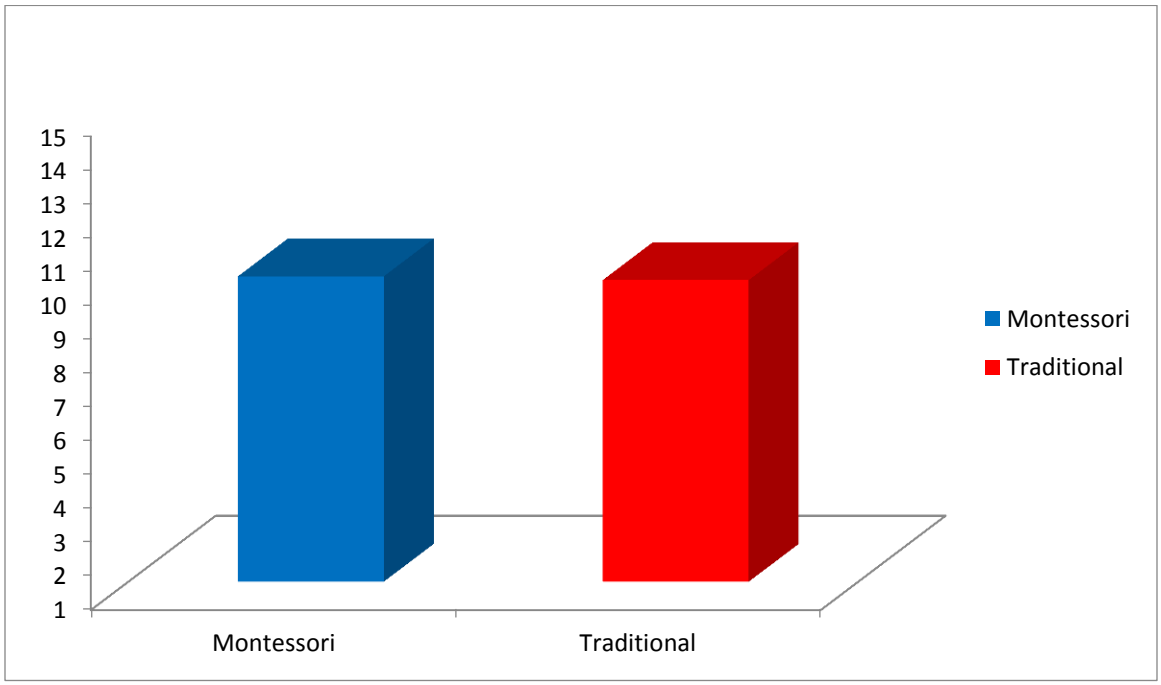

Figure 6. Average gain score on the School Readiness Numbers/Counting subtest of the Bracken Scale by bilingual program type.

For the Sizes/Comparisons subtest and for both bilingual programs, the Comparison pre-test score was subtracted from the Sizes/Comparisons post-test score,

creating a gain score. This gain score reflects the amount of growth in this area and was used as the dependent variable in this analysis. To determine whether a statistically significant difference was present in the Sizes/Comparisons subtest gain scores between students in these two bilingual programs, an independent samples *t*-test was conducted, after checks that its underlying assumptions were met. The independent samples *t*-test yielded a statistically significant difference, $t(589.89) = 4.09$, $p < .001$. As indicated in Table 7, Spanish-speaking students in the Montessori bilingual program had a higher average gain score, 2.13, than did Spanish-speaking students in the traditional bilingual program, 1.65. The effect size, Cohen's *d* was 0.34, a small effect size (Cohen, 1988).

Table 7.
Descriptive Statistics for the School Readiness Sizes/Comparisons Subtest of the Bracken Scale by Bilingual Program Type

Bilingual Program Type	*n*	*M*	*SD*
Montessori	300	2.13	1.49
Traditional	300	1.65	1.33

The average gain score for Spanish-speaking students on the School Readiness Sizes/Comparisons subtest is depicted in Figure 7. Similar to the previous two analyses, Spanish-speaking students in the Montessori bilingual education program had a higher average gain score on this subtest than did Spanish-speaking students in the traditional bilingual prekindergarten program.

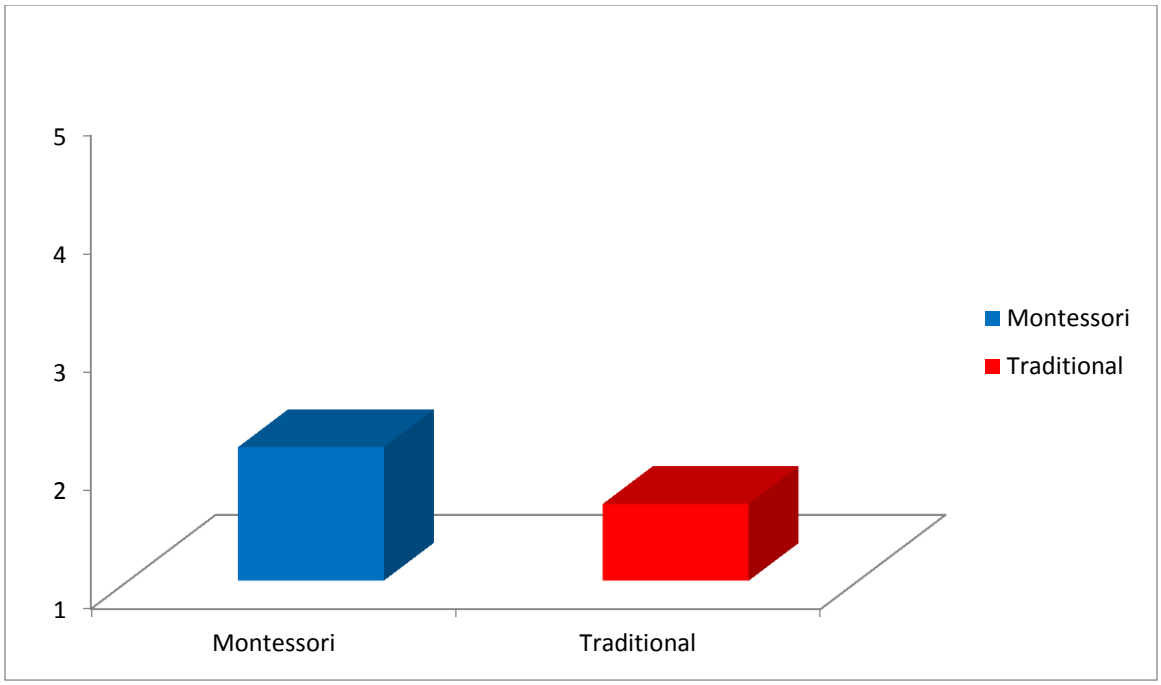

Figure 7. Average gain score on the School Readiness Sizes/Comparisons subtest of the Bracken Scale by bilingual program type.

For the Shapes subtest and for both bilingual programs, the Shapes pre-test score was subtracted from the Shapes post-test score, creating a gain score. This gain score reflects the amount of growth in this area and was used as the dependent variable in this analysis. To determine whether a statistically significant difference was present in the Shapes subtest gain scores between students in these two bilingual programs, an independent samples *t*-test was conducted, after checks that its underlying assumptions were met. The independent samples *t*-test revealed a statistically significant difference, $t(594.27) = 5.12$, $p < .001$. As delineated in Table 8, Spanish-speaking students in the Montessori bilingual program had a higher average gain score, 4.56, than did Spanish-speaking students in the traditional bilingual program, 3.74. The effect size, Cohen's *d* was 0.42, a small effect size (Cohen, 1988).

Table 8.
Descriptive Statistics for the School Readiness Shapes Subtest of the Bracken Scale by Bilingual Program Type

Bilingual Program Type	*n*	*M*	*SD*
Montessori	300	4.56	2.04
Traditional	300	3.74	1.88

The average gain score for Spanish-speaking students on the School Readiness Shapes subtest is depicted in Figure 8. Similar to the previous three analyses, Spanish-speaking students in the Montessori bilingual education program had a higher average gain score on this subtest than did Spanish-speaking students in the traditional bilingual prekindergarten program.

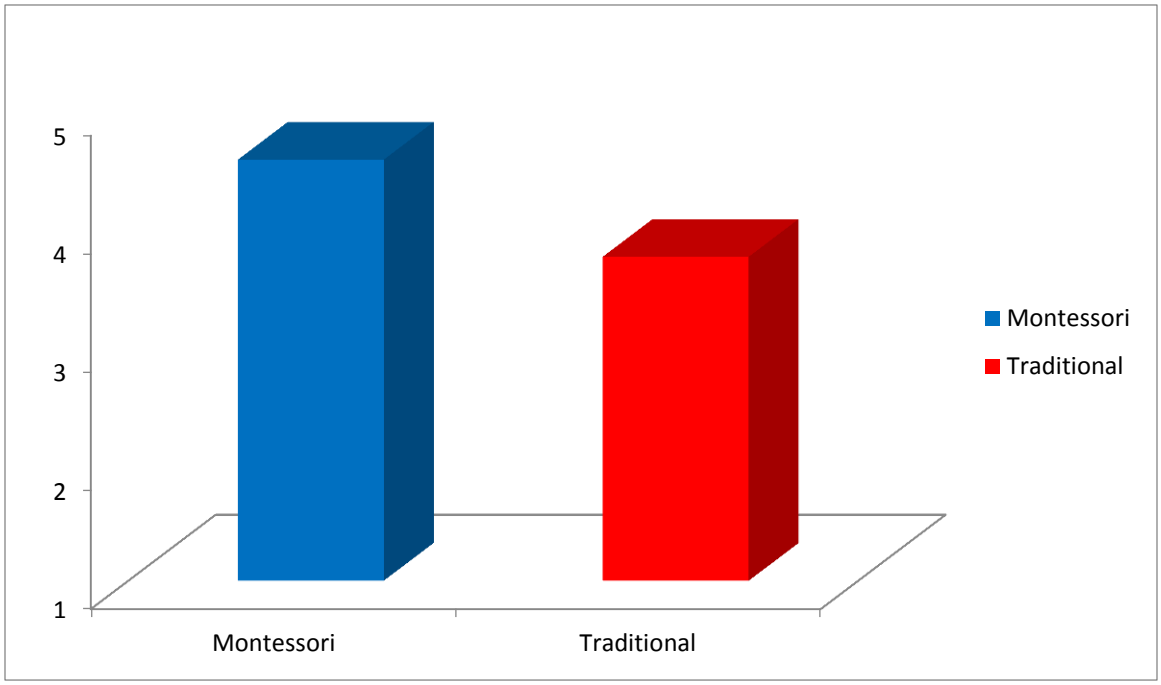

Figure 8. Average gain score on the School Readiness Shapes subtest of the Bracken Scale by bilingual program type.

Finally, with respect to gain scores, the School Readiness Composite Scale pre-test score was subtracted from the School Readiness Composite Scale score, creating a total gain score percentage. This gain score reflects the total amount of growth on the School Readiness Composite Scale and was used as the dependent variable in this analysis. To determine whether a statistically significant difference was present in the School Readiness Composite Scale gain scores between students in these two bilingual programs, an independent samples *t*-test was conducted, after checks that its underlying assumptions were met. The independent samples *t*-test revealed a statistically significant difference, $t(597.97) = 7.83$, $p < .001$. As indicated in Table 9, Spanish-speaking students in the Montessori bilingual program had a higher percentage score on the School Readiness Composite Scale, 37.37%, than did Spanish-speaking students in the traditional bilingual program, 28.04%. The effect size, Cohen's *d* was 0.64, a moderate effect size (Cohen, 1988).

Table 9.
Statistics for the School Readiness Composite Scale Gain Scores by Bilingual Program Type

Bilingual Program Type	*n*	*M*	*SD*
Montessori	300	37.37%	14.65%
Traditional	300	28.04%	14.54%

The average percent gain score for Spanish-speaking students on the School Readiness Composite Scale is shown in Figure 9. Spanish-speaking students in the Montessori bilingual education program had a 9.34% higher gain score on the School Readiness Composite scale than Spanish-speaking students in the traditional bilingual prekindergarten program.

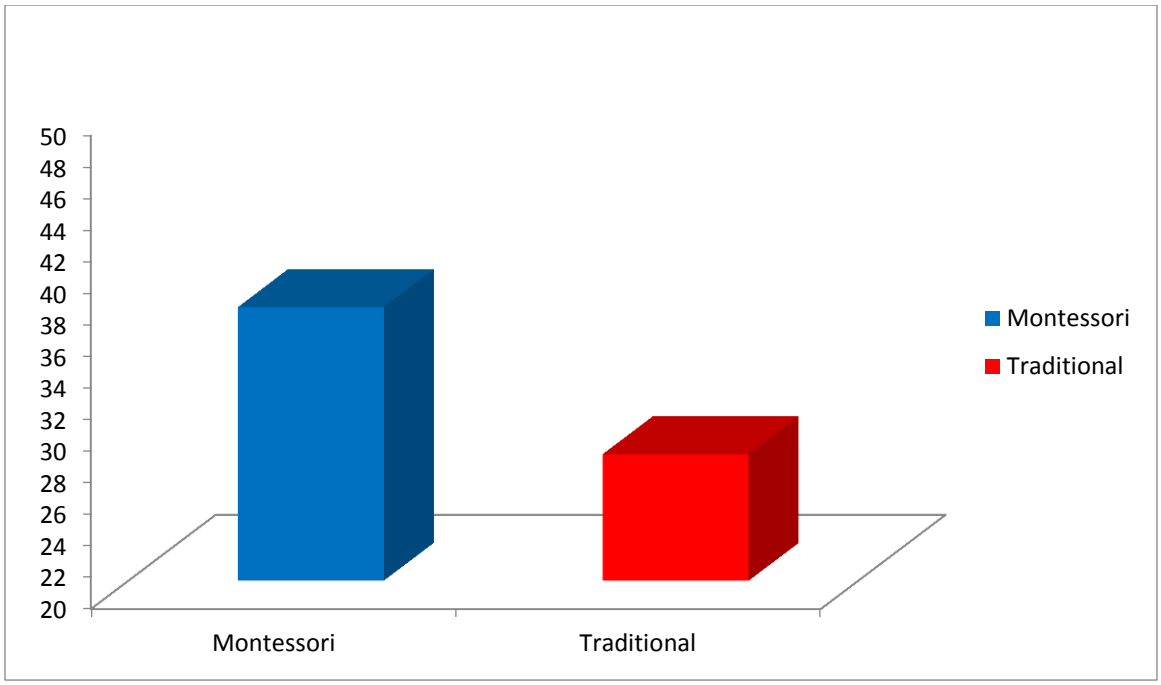

Figure 9. Average percent gain score on the School Readiness Composite Scale of the Bracken Scale by bilingual program type.

The final set of statistical analyses involved the use of linear regression to determine the magnitude to which involvement in either the Montessori or the traditional bilingual prekindergarten program could predict student success on each of the five School Readiness subtests. For these analyses, a separate linear regression was conducted for each of the five School Readiness subtests. In each linear regression, the independent variable was bilingual education program type and the dependent variable, one at a time, was the particular School Readiness subtest. For the Color subtest posttest score, the result was not statistically significant ($p > .05$). A similar result was present for the Letter/ Sounds posttest score ($p > .05$). With respect to the Numbers/Counting posttest score, the result was statistically significant, $F(1, 598) = 22.70$, $p < .001$, and accounted for 3.7% of the variance. This 3.7% of the variance in the Numbers/Counting posttest score by bilingual education program type reflected a small effect size (Cohen, 1988).

Concerning the Sizes/Comparisons posttest score, the result was also statistically significant, F (1, 598) = 41.69, $p < .001$, and accounted for 6.5% of the variance. This 6.5% of the variance in the Sizes Comparisons posttest score by bilingual education program type reflected a moderate effect size (Cohen, 1988). Regarding the Shapes posttest score, the result was again statistically significant, $F(1, 598) = 57.15$, $p < .001$, and accounted for 8.7% of the variance. This 8.7% of the variance in the Shapes posttest score by bilingual education program type reflected a moderate effect size (Cohen, 1988).

The final statistical analysis was a linear regression conducted on the School Readiness Composite Scale Gain Scores, with the bilingual education program serving as the independent variable. Similar to the last three individual School Readiness subtest findings, the result was statistically significant, $F(1, 598) = 61.28$, $p < .001$, and accounted for 9.3% of the variance. This 9.3% of the variance in the School Readiness Composite Scale gain scores by bilingual education program type reflected a moderate effect size (Cohen, 1988).

Qualitative Research Questions. For the qualitative part of the study, respondents included two administrator leaders from the two programs involved in the study. Administrator 1 is a first year principal. This administrator started as a bilingual teacher in the Montessori center, she earned her Montessori certification. She moved out the district and went to a private Montessori school as an administrator, she came back as a grant coordinator to the same school and in few months later, she became assistant principal in a traditional prekindergarten center. After five years as an assistant principal, she was name principal at the Montessori center that participated in this study. Administrator 2 is an assistant principal in the traditional prekindergarten center, which

was involved in the study, too. She started her career in another district as a teacher and she came to the study district as an assessment specialist, and she has been acting as an assistant principal at the traditional bilingual program for the last six years.

Qualitative Research Question One. What are principals' insights of the effectiveness of the bilingual prekindergarten Montessori program in preparing the students for literacy/reading and math? Answers were categorized in themes following Ryan and Bernard's techniques (Ryan & Bernard, 2003).

Principals' answers have been categorized in two themes regarding the effectiveness of the bilingual prekindergarten Montessori program in preparing the students for literacy/reading and math: (a) purposeful materials and (b) lesson presentation. Extracts and discussions of results are reported by the subjects as follow.

Theme 1: Purposeful materials.

Administrator 1: All the materials and activities have a purpose. Materials are hands-on and they go from concrete to abstract. "They are very purposeful in the Montessori and every activity has a purpose". In reading, students start identifying sounds all the way to read sentences while in math, students start working with pre-math activities all the way to add, subtract, and building numbers in the decimal system.

Administrator 2: "The Montessori materials are meaningful and purposeful hand-on activities provided to further engaged the students in the lesson".

Additionally, the two administrators stated that the bilingual Montessori program lays a solid foundation for bilingual prekindergarten students in acquiring early literacy and reading skills and the concretized concepts in Montessori materials are fundamental in the program.

Theme 2: Lesson Presentation.

Administrator 1: In a Montessori classroom, lesson are presented from simple to complex and in the Montessori classroom the student's engagement is greater due to the student interactions and the hands-on materials. Montessori lessons prepare and organize the child's mind like in little files folders that they are able to be retrieved them when the child needs them. The child learns where each thing goes and he/she is able to identify when and how they learned the concepts, calling this process metacognition.

Administrator 2: Lessons are presented to encompass all modalities of learning: visual, kinesthetic, auditory, and psychomotor.

Both administrators concurred that lessons are presented using The Three Period Lesson which is basically the Gradual Released Model (I do, we do, and you do model). Lessons increased the level of rigor as they move from simple to complex.

Qualitative Research Question Two. What do principals recognize as the necessary skills for English Language Learners to be fluent readers?

Responses haven categorized in two themes regarding what the principals recognized as the necessary skills for English Language Learners to be fluent readers: (a) oral language development and (b) exposure to literacy. Extracts and discussions of results are reported by the subjects as follow.

Theme 3: Oral Language Development.

Administrator 1: Students enrolled in the Montessori bilingual program are lacked of vocabulary. They may need a basic language in their native language so they are able to learn their academic language to be successful in school. The Montessori program helps the bilingual students because reading, in the Montessori program, is a process

from sounds to building some words, to build phrases and to building sentences. Teachers need to not just be certified in ESL, but they need to be well equipped with strategies so students are able to learn and to become fluent readers.

Administrator 2: ELL students have to be fluent in speaking before they can successfully achieve fluency in oral reading.

Moreover, the two administrators indicated that bilingual students must have a foundation in their native language to be successful in reading. Building background knowledge helps students to move towards the academic language.

Theme 4: Exposure to literacy.

Administrator 1: It is necessary to expose the children to different forms of literacy beside books. Oral literacy and written literacy with vivid language development need to be addressed in the classroom to close the gap. Sometimes, our ELL are coming from homes where the exposure to literacy does not happen.

Administrator 2: Continuous exposure to different types of language like descriptive language, expansive narrative and positive reinforcement for communication are some of the required skills to help ELL to be successful. Likewise, exposure to a print-rich environment benefits from early exposure to reading and print concepts such as letters and sounds. Some simple skills like, left to right on a page and front to back in a book, are very important to teach ELL in bilingual prekindergarten programs.

Qualitative Research Question Three. What are the areas of the BBCS:E test that principals perceive as the most important for School Readiness?

The two administrators have chosen one area as the most important for School Readiness: letters/sounds. Extracts and discussions of results are reported by the subjects as follow.

Theme 5: Letter/sound.

Administrator 1: Sound area is the most important are for School Readiness. Knowing the letter sounds and understanding that sounds make words, the child is able to read. Comprehension is critical; reading without understanding is worthless. Even in math is important reading, children need to have the vocabulary to answer questions, like opposites, and more.

Administrator 2: All the subtest of the SRC are important because the acquisition of basic concepts is related to cognitive and language development as to early childhood academic achievement. The letter knowledge is the most essential component to read and write.

Conclusions

The independent samples *t*-tests and the linear regression analyses were conducted to determine if differences exist in the impact of the Montessori bilingual program compared with the traditional bilingual program on the School Readiness Composite gain scores. On the Color subtest the independent samples *t*-test revealed a statistically difference, $t(592.01) = -2.38$, $p = .018$, where Spanish-speaking students in the traditional bilingual program had higher average gain scores than Spanish-speaking students in the Montessori bilingual program. On the Letter/Sounds subtest the independent samples *t*-test failed to yield statistically significant different, $t(595.52) = 1.84$, $p = .066$. On the Numbers/Counting subtest, the independent samples *t*-test did not

reveal a statistically significant difference, $t(594.23) = 0.36$, $p = .716$. On the Size/Comparisons subtest, the independent samples *t*-test resulted in a statistically significant difference, $t(589.89) = 4.09$, $p < .001$, with the Spanish-speaking students in the Montessori bilingual program scoring higher. On the Shapes subtest, the independent samples *t*-test indicated a statistically significant difference, $t(594.27) = 5.12$, $p < .001$, with the Spanish-speaking students in the Montessori bilingual program scoring higher. Finally, with respect to gain scores, the School Readiness Composite Scale, the independent samples *t*-test revealed a statistically significant difference, $t(597.97) = 7.83$, $p < .001$, with the Spanish-speaking students in the Montessori bilingual program scoring higher.

Linear regression analyses were calculated to determine the magnitude to which involvement on either the Montessori or the traditional bilingual education program could predict student success on the each of the five School Readiness subtests. For the Color and for the Letter/Sounds posttest scores, the results were not statistically significant ($p > .05$). With respect to Numbers/Counting, Size/Comparisons and Shapes posttest scores, the results were statistically significant. In reference to the SRC scale, the linear regression result was $F(1, 598) = 61.28$, $p < .001$, and accounted for 9.3% of the variance. This 9.3% variance reflected a moderate effect size (Cohen, 1998). With the exception of the Color subtest, Spanish-speaking students enrolled in the Montessori bilingual education program outperformed Spanish-speaking students who were enrolled in the traditional bilingual prekindergarten program.

Principals' beliefs regarding the effectiveness of the public bilingual prekindergarten Montessori program on the Bracken School Readiness Assessment Test

outcomes were similar. Their responses have been categorized into five themes: (a) Purposeful materials, (b) Lesson presentation, (c) Oral language development, (d) Exposure to literacy, and (e) Letter/sound. The two administrators stated that the bilingual Montessori program lays a solid foundation for bilingual prekindergarten students in acquiring early literacy and reading skills and the concretized concepts in Montessori materials are fundamental in the effectiveness. Teachers need to not just be certified in ESL, but they need to be well equipped with strategies so students are able to learn and to become fluent readers and the teachers in the Montessori program had an intensive training. Additional, the two administrators indicated that bilingual students must have a foundation in their native language to be successful in reading and they agreed that the letter knowledge is the most essential component of the SRC to read and write.

Chapter V

Discussion, Implications, and Recommendations

Introduction

Cited in the State Preschool Yearbook (2013) was that, after 2011-2012 downturn in spending and quality, many state prekindergarten program budgets leveled off even regaining some ground. As state budgets emerged from recession, policymakers prioritized early education programs. The 2011-2012 school year was the first year, since 2001-2002, that state failed to increase the number of children they serve in prekindergarten. There were 1,338,737 students enrolled in prekindergarten programs in the USA, which 205,056 students were enrolled in the state of Texas. Only 52% of the 4-year old students in the state of Texas attended prekindergarten in 2012-2013 because prekindergarten is not universal and students must qualify by income and/or language among other qualifications (Prekindergarten State Law, 2007). Texas is the state with the largest number of the students enrolled in prekindergarten programs but is 33rd in the nation in spending budget per students. Texas spent an average of $3,366 per prekindergarten student compared with $10,093 on average per prekindergarten student at the national level. Texas only meets two of the national quality standards, Texas has early learning standards, knew it as Texas Prekindergarten Guidelines, and teacher in-service with a minimum of 15 hours per year (Barnett et al., 2013).

The two bilingual prekindergarten programs, involved in this study, met seven of the quality national standards. Even both bilingual programs required the state bilingual certification for the teachers involved in this study, the Montessori bilingual program requires an extra teacher specialized training beside the state bilingual certification. It

requires one-year internship in the area of Montessori bilingual program. Through this training, the Montessori programs pay particular attention to a child's sensitive periods, using the teacher's observations to know when to introduce a particular lesson, encouraging children's freedom in learning, and offering a prepared environment (Vo, 2014).

Discussion of Results

The purpose of the study was to determine the magnitude to which a statistically significant difference was present between a group of Spanish-speaking prekindergarten students attending a Montessori bilingual program and a group of Spanish-speaking prekindergarten students attending traditional bilingual prekindergarten programs on the Bracken scores. A moderate size effect was found (Cohen, 1988). A mixed methods research design was utilized to respond the research questions. Responses are reported according to the quantitative question and to the qualitative questions.

Quantitative Research Question. The results of the quantitative question are analyzed and interpreted in the following paragraphs. Implications and recommendations are provided after the results are discussed. Prior to providing that information, the first research question will be restated below:

Research Question One: Is there a significant difference in the BBCS:E scores in the School Readiness Composite Scale between Spanish-speaking students that attended a public Montessori prekindergarten bilingual program and Spanish-speaking students who attended a traditional prekindergarten bilingual program?

The Spanish-speaking students in the traditional bilingual program, in the Colors subtest, had a statistically significant different performance than the Spanish-speaking

students enrolled in the Montessori bilingual program. In the Letter/Sounds subtest, a statistically significant difference was not present. In the Size/Comparison, and Shapes subtests, the independent samples *t*-tests yielded statistically significant differences. The same results were present on the School Readiness Composite Scale. When the linear regression analyzes were conducted, results congruent with the results of the independent samples *t*-tests. The School Readiness Composite Scale was statistically significant and accounted for 9.3% of the variance, reflecting a moderate effect size (Cohen, 1988). Spanish-speaking students who attended the bilingual prekindergarten Montessori program had higher test scores, with the exception of the Colors subtest, as a result of the extensive training that bilingual teachers receive in the Montessori center (Vo, 2014) and the prepared environment and didactic materials that are a distinct part of the Montessori program (Standing, 1998).

Colors are taught in the Montessori classroom by using three Color Tablet Boxes. Box 1 has 6 tablets; a pair of each of the primary colors (red, yellow, blue). These are the most sharply contrasted colors. Box 2 contains 22 tablets; a pair of each of the primary colors, the secondary colors (green, orange, purple), and also pink, brown, black, white, and grey. Box 3 contains 63 tablets; 7 shades of 9 colors: red, yellow, blue, green, orange, purple, brown, pink, and grey. Spanish-speaking students attending a Montessori bilingual program are exposed to many colors and shades that are not assessed in the Bracken (Corely, 1995). There are 11 colors that are taught, learned, and assessed in the traditional bilingual prekindergarten program. The important information to note is that Colors are not part of curriculum of the Texas Prekindergarten Guidelines. If the window

for the testing is not followed, students learn the colors and at the time of testing, it is not space for growth.

Shapes are taught in the Montessori program by introducing three basic shapes first, using the geometric cabinet that includes 23 more shapes and the 10 geometric solids. Another reason the Montessori students scored higher in the Size/Comparison subtest is due to the same opportunity that students in the Montessori program have to interact with a meaningful and purposeful materials. Statistically significant differences were not present for the Letters and Numbers subtest because Bracken assessed only the same concepts that students are expected to learn in prekindergarten. Students in the Montessori program are exposed to reading and decimal system and they are not assessed in the Bracken test neither in the ROP.

Qualitative Research Questions. The answers of the three qualitative questions are interpreted and discussed in this section. Implications and recommendations are then provided after discussing the results. Prior to presenting this information, the three qualitative research questions will be restated:

Research Question One: What are principals' insights of the effectiveness of the bilingual prekindergarten Montessori program in preparing the students for literacy/reading and math?

Research Question Two: What do principals recognize as the necessary skills for English Language Learners to be fluent readers?

Research Question Three: What are the areas of the BBCS:E test that principals perceive as the most important for School Readiness?

Two principals were interviewed and provided their insights about their beliefs on the Bracken results. Principals' responses were categorized in five themes: (a) Purposeful materials, (b) Lesson presentation, (c) Oral language development, (d) Exposure to literacy, and (e) Letter/sound. Principals emphasized the hands-on and purposeful Montessori materials that Spanish-speaking students in these programs are able to work on. In summary, Montessori's materials tend to be overemphasized, but they are as important as the rest of the components. To serve their purpose of internal formation, the materials must correspond to children's' inner needs. In addition to being meaningful, there are at least five more principles for these materials. First, the difficulty or the error of the materials needs to be isolated. Second, the materials progress from simple to complex. Third, the materials are to prepare children for future learning. Fourth, the materials progress from concrete to abstract. Finally, materials are designed for auto-education and the control of error. Children are lead in how to use the materials and permitted to recognize their own mistakes (P. P. Lillard, 1989).

Referring to Lesson Presentation, both administrators concurred that lessons are presented using The Three Period Lesson which is basically the Gradual Released Model (I do, we do, and you do model). Lessons increased the level of rigor as they move from simple to complex. The Three Period Lesson is a way to present the Montessori lessons making this a powerful instrument in the Montessori setting and it became as a new tool for teaching in the traditional bilingual program as the Gradual Release Model (Echevarría, 2008).

Both principals agreed that students must be taught first in their native language to be successful in English. Renton (1998) stated that the complex multicultural and

multilingual reality of America education today was affecting Montessori programs, especially in the public schools. Issues in early childhood education are of concern in an increasingly changing society. These responses include Montessori school's support for home-language maintenance and for second language, bilingual multicultural, and immersion programs whose aim is to utilize the sensitive period for language development more fully, from prekindergarten through elementary.

The theme related to literacy is the opportunity for the students to develop vocabulary. In conclusion, children develop the understanding of the everyday functions of print and are motivated to want to learn to read and appreciate different forms of literacy—from nonfiction and fiction books, to poems, songs, and nursery rhymes—by being read to and interacting with stories and print. It is recommended to have a minimum of five books per child in the classroom. Another factor that promotes print development is a well-planned physical room arrangement rich with environment print impacts language development and the interactions among the children. Labels with words and pictures are very important for students to make connections between written language and things that they represent ("Texas Guidelines," 2008).

The two principals involved in this study chose the Letter/sounds as the most important skill needed for the students to be successful in school. Montessori (1972) stated that children do not read until they receive ideas from the written world. Writing prepares children for mechanically interpreting the combined sounds of the letters that compose the world which the children see written. In other words, children can read the sounds of the world.

Implications for School Leaders

Statistical analyses in this investigation revealed statistically significant results. The Numbers/Counting, Size/Comparison, and the Shapes subtests, as well the SRC scale revealed statistically significant differences. Spanish-speaking students who were enrolled in the Montessori bilingual program had higher test scores than the Spanish-speaking students who were enrolled in the traditional bilingual prekindergarten program. The Letter/Sounds subtest did not yield a statistically significant difference. The Color subtest was statistically significant and was the only instance where the Spanish-speaking students in the traditional bilingual program had a higher gain score than the Spanish-speaking students in the Montessori bilingual program. It is important to point the Colors are not part of the Texas Prekindergarten Guidelines ("Texas Guidelines," 2008). Perhaps, policymakers in Texas could make a revision and include Colors a part of the state curriculum. The Colors pretest in the traditional bilingual program was lower at the beginning of the school year and provided students an opportunity for more improvement. At the same time, only ten colors are present for students to identify in the Bracken test. As such, it does not allow the Montessori bilingual program to show more growth even more colors are taught at the Montessori program.

Even the other quality national standard that the state of Texas is meeting is related to the 15 hours per year of in-services that staff attended, it is not sufficient to prepare the students for kindergarten, like Montessori program does. It is not only the number that hours but the quality of the in-services that needs to be evaluated in a traditional bilingual program. The prepared environment and the didactic materials made

a difference in the results due that each material in the prepared Montessori environment has a direct purpose. It goes beyond prekindergarten guidelines and ROP requirements.

School leaders need to understand and support bilingual programs in early childhood education, particularly programs that have been demonstrated to be effective, such as the bilingual Montessori program. Texas needs to invest more dollars in early childhood education, if they want to students to be successful in school because 90% of the brain development occurs by age five.

Implications for Further Research

In this study, limitations were present. The most important limitation reflects the lack of bilingual Montessori programs in the United States and the lack of materials and centers to train the teachers in the area. Present in the school district whose data were analyzed in this investigation were six more bilingual programs that could provide additional information. The second limitations involves the fact that teachers tested the own students, one to one, in both programs and it may affect the results. A third limitation reflects the window in which the test was conducted. The school district from which test score data were obtained and analyzed provided programs with a 3-week window for testing. Some of the schools began immediately testing whereas other schools waited until the end of this 3-week time period. Accordingly, the following recommendations are made:

a) Using all the prekindergarten bilingual programs existing in the district involved in the study.
b) Creating a testing team to test the Spanish-speaking students in the bilingual prekindergarten programs

c) Reducing the number of days for the testing and ensuring that window for testing is followed.

Conclusions

Address in this investigation were two specific problems: (a) the impact of the bilingual prekindergarten Montessori program on the BBCS:E and (b) lack of research of Montessori programs in a bilingual setting. Important results have been discussed in this investigation regarding the influence of a Montessori bilingual program on student achievement. In almost all of the statistically significant results, Spanish-speaking students in the bilingual Montessori program outperformed Spanish-speaking students in the traditional bilingual program.

Even though limited research studies are present regarding bilingual Montessori programs, the evidence that is available is supportive that the Montessori curriculum has positive effects on LEP students (Rodriguez, 2002). The importance of the purposeful materials, lesson presentation, oral language development, expose to literacy, and the letter/sounds if they are provide in the students' native language, the students have the opportunity to be successful in school. Principals who support the Montessori program are critical for the success of the program. At this time, the literature is sparse regarding the leadership of prekindergarten Montessori bilingual program. This study is offering some insights of principals who support the Montessori program. In conclusion, results indicate that the Montessori bilingual program is an effective bilingual program and one that should provide leaders an option in reforming prekindergarten for LEP students.

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Appendix A

ISD Consent to Participate in Research Form

Maria I. Galindo

Independent School District

Permission to Apply for Research Study

You must first obtain the approval of the appropriate district level administrator prior to beginning a master or doctoral research project. Complete this form, attach all RESEARCH STUDY REQUIREMENTS, and submit it to the Assistant Superintendent of Curriculum and Instruction.

1. Applicant/s
   a. Name/s & Title/s Maria I. Galindo- Date June 30, 2014
   b. School/Building (if employee)
   c. Telephone number
2. Description of proposed research
   a. Title of project A PUBLIC BILINGUAL PREKINDERGARTEN MONTESSORI PROGRAM AND ITS IMPACT ON BRACKEN TEST LITERACY OUTCOMES: PRINCIPALS' BELIFS ON THE RESULTS
   b. Duration of project (e.g., 6 months, 3 years) 1 year From: June, 2014 To: June, 2015
   c. Description of people participating in the project:
   (1) Number 600 Students' scores (2) Age(s) 4 and 5 year olds (3) Grade Level(s) Prekindergarten
   d. Name/s of schools/s :
   e. Does this research require hiring additional employees? Yes ☐ No ■
   How many? Not Applicable Position/s and Number Not Applicable
3. Who is your subject area program director if you are an Aldine employee?
   Have you discussed this project with him/her? Yes■ No ☐
4. How will the proposed research benefit Aldine students?
   The emerging results from their responses and data analysis will be categorized to discover the leadership perspectives behind the effectiveness of each program. The results of this study will inform school leaders of the effectiveness of early childhood traditional bilingual or Montessori bilingual programs in the area of school readiness.

5. Attach Research Study Requirements as stated on the following page

NLY

Campus Administrator(s) — Date 6-30-2014

Cabinet Level Administrator(s) — Date 6/30/14

Assistant Superintendent of Curriculum/Instruction — Date 7-14-14

Approved X Disapproved ☐

Appendix B

Approval from the University of Houston Human Subject Research Committee

UNIVERSITY of HOUSTON

DIVISION OF RESEARCH

September 23, 2014

Maria Galindo
Educational Leadership & Cultural Studies

Dear Maria Galindo,

Based upon your request for exempt status, an administrative review of your research proposal entitled "A PUBLIC BILINGUAL PREKINDERGARTEN MONTESSORI PROGRAM AND ITS IMPACT ON BRACKEN TEST LITERACY OUTCOMES: PRINCIPALS' BELIFS ON THE RESULTS" was conducted on July 18, 2014.

At that time, your request for exemption under **Category 2** was approved pending modification of your proposed procedures/documents.

The changes you have made adequately respond to the identified contingencies. As long as you continue using procedures described in this project, you do not have to reapply for review. * Any modification of this approved protocol will require review and further approval. Please contact me to ascertain the appropriate mechanism.

If you have any questions, please contact Samoya Copeland at (713) 743-9534.

Sincerely yours,

Kirstin Rochford, MPH, CIP, CPIA
Director, Research Compliance

*Approvals for exempt protocols will be valid for 5 years beyond the approval date. Approval for this project will expire **September 22, 2019.** If the project is completed prior to this date, a final report should be filed to close the protocol. If the project will continue after this date, you will need to reapply for approval if you wish to avoid an interruption of your data collection.

Protocol Number: 14500-EX

316 E. Cullen Building Houston, TX 77204-2015 (713) 743-9204 Fax: (713) 743-9577

Appendix C

Consent to Participate from Principals

UNIVERSITY OF HOUSTON
CONSENT TO PARTICIPATE IN RESEARCH

PROJECT TITLE: The Impact of Public Bilingual Prekindergarten Montessori Program on Bracken Test Literacy Outcomes: Principal's Beliefs of its effectiveness.

You are being invited to take part in a research project conducted by Maria I. Galindo from the Department of Executive Education Doctoral Program at the University of Houston. This study is a part of thesis is being conducted under the supervision of Dr. Angus MacNeil.

NON-PARTICIPATION STATEMENT
Taking part in the research project is voluntary and you may refuse to take part or withdraw at any time without penalty or loss of benefits to which you are otherwise entitled. You may also refuse to answer any research-related questions that make you uncomfortable.

PURPOSE OF THE STUDY
The early years (0-6 years-old) are critical stages in development and learning. Dr. Montessori gave the world a practical, tested scientific method for bringing forth the very best in young human beings. She taught adults how to respect individual differences and to emphasize social interaction and the education of the whole personality rather than teaching a specific body of knowledge (Montessori, 1964). In a bilingual classroom, it is important that students receive appropriate education to close the academic gap between English speaking and Spanish speaking students. A mixed methods study will be used to find if there is a significant difference between the two groups that will be compared, the group of students attending a Montessori bilingual program and the students attending traditional bilingual prekindergarten programs. This study's results will provide important data for administrators and teachers to make decisions when making recommendations to reform bilingual education in prekindergarten.
This study will be done in one school year and it will take 30 minutes to interview each principal separately.

PROCEDURES
A total of __2__ subjects at __2__locations will be invited to take part in this project. You will be one of approximately __2__ subjects invited to take part at this location.

Describe the research project in clear, concise language appropriate to the targeted subject population (for a non-scientific subject, language should be readable at an 8th grade level). This should include, but not be limited to:

- It will be one face to face interview, responses will be recorded on a paper
- It will be only one session
- Answers to three questions will be collected
- Here are the questions that will be asked.

- What are principals' insights of the effectiveness of the bilingual prekindergarten Montessori program in preparing the students for literacy/reading?
- What do principals recognize as the necessary skills for English Language Learners to be fluent readers?
- What are the areas of the BBCS:E test that principals perceive as the most important for School Readiness?

CONFIDENTIALITY

The subject's identity will be held in confidence. Every effort will be made to maintain the confidentiality of your participation in this project. Each subject's name will be paired with a code number by the principal investigator. This code number will appear on all written materials. The list pairing the subject's name to the assigned code number will be kept separate from all research materials and will be available only to the principal investigator. Confidentiality will be maintained within legal limits.

RISKS/DISCOMFORTS

There are no forseeable risks during the study.

BENEFITS

While you will not directly benefit from participation, your participation may provide important data for administrators and teachers to make decisions when making recommendations to reform bilingual education in prekindergarten.

ALTERNATIVES

Participation in this project is voluntary and the only alternative to this project is non-participation.

PUBLICATION STATEMENT

The results of this study may be published in scientific journals, professional publications, or educational presentations; however, no individual subject will be identified.

SUBJECT RIGHTS

1. I understand that informed consent is required of all persons participating in this project.

2. I have been told that I may refuse to participate or to stop my participation in this project at any time before or during the project. I may also refuse to answer any question.

3. Any risks and/or discomforts have been explained to me, as have any potential benefits.

4. I understand the protections in place to safeguard any personally identifiable information related to my participation.

5. I understand that, if I have any questions, I may contact Maria I. Galindo at 281-985-7500 I may also contact Dr. Angus MacNeail, faculty sponsor, at 713-743-5038

6. **Any questions regarding my rights as a research subject may be addressed to the University of Houston Committee for the Protection of Human Subjects (713-743-9204). All research projects that are carried out by Investigators at the University of Houston are governed be requirements of the University and the federal government**.

SIGNATURES

I have read (or have had read to me) the contents of this consent form and have been encouraged to ask questions. I have received answers to my questions to my satisfaction. I give my consent to participate in this study, and have been provided with a copy of this form for my records and in case I have questions as the research progresses.

Study Subject (print name): _____
Signature of Study Subject: _____
Date: _____

I have read this form to the subject and/or the subject has read this form. An explanation of the research was provided and questions from the subject were solicited and answered to the subject's satisfaction. In my judgment, the subject has demonstrated comprehension of the information.

Principal Investigator (print name and title): _____
Signature of Principal Investigator: _____
Date: _____
This project has been reviewed by the University of Houston Committee for the Protection of Human Subjects (713) 743-9204.

Appendix D

E-mail to Ask for Principals' Participation

Consent to participate in my dissertation
Maria I Galindo to: I 09/23/2014 11:34 AM

Dear Ms.
I am sending this email to ask you for your consent to participate in an interview for my dissertation. Please sign and return this letter if you accept participate.

Thanks,
This project has been reviewed by the University of Houston Committee for the Protection of Human Subjects (713) 743-9204.

Confidential Research Permission Letter.docx

Maria I. Galindo

Appendix E

Interview Questions for Principals

Interview Questions for Principals

1. What are principals' insights of the effectiveness of the bilingual prekindergarten Montessori program in preparing the students for literacy/reading and math?

2. What do principals recognize as the necessary skills for English Language Learners to be fluent readers?

3. What are the areas of the BBCS:E test that principals perceive as the most important for School Readiness?