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Veronica Celedon-Rodriguez

December 2015

MEASURING STUDENT SUCCESS: A STUDY OF A DUAL LANGUAGE
PROGRAM VS. A TRANSITIONAL LATE-EXIT BILINGUAL PROGRAM

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

In Partial Fulfillment
of the Requirements for the Degree

Doctor of Education

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Abstract

The purpose of this study is to examine differences in math and reading achievement between ELL students served in a Dual Language Two-Way Immersion program and those who are served in a Transitional, Late-Exit Bilingual program. The independent sample t-test, effect size, and Chi Square analysis will be used to examine the academic performance of a Dual Language/Two-Way immersion student cohort in the 2012, 2013, and 2014 English reading and math STAAR compared to the academic performance of a Transitional, Late-Exit Bilingual student cohort in the 2012, 2013, and 2014 English Reading and Math STAAR.

In the summary findings of this study, there was a connection between higher scores in Reading and the type of language program students participated in. There was a significant difference in how the two groups performed in Reading, which could be related to the type of language program instruction received. However, in Mathematics, there was no evidence for a relationship between the type of language program the students participated in and their Mathematics academic performance.

The findings of this study will provide data that helps one school district evaluate its current ELL programs and guide leaders through the decision-making process of choosing and implementing programs that most effectively serve the district's ELL population.

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Chapter I

Introduction

Background of the Study

Major demographic shifts are occurring in school districts across the country as communities receive immigrants from around the world (Tellez & Waxman, 2005). The fastest growing demographic group in public schools in all regions of the United States is students whose language is not English (Collier & Thomas, 2010). Between 2002 and 2012, the percentage of ELLs in United States public schools increased from 8.7% to 9.1% for a current total of approximately 4.4 million ELL students nationwide (U.S. Department of Education, 2014). Many times students entering schools in the United States who speak a language other than English are viewed as experiencing a problem that educators must correct (Tellez & Waxman, 2005). Traditionally, ELLs are expected to master content in English before they have reached a certain level of English proficiency that would allow them to achieve such mastery.

The size of the foreign-born population has increased over the last three decades, from 14.1 million in 1980 to 40 million in 2010. In 2012, the foreign born numbered 40.8 million, including 40.6 million age five years and older (United States Census Bureau, 2014). Nationwide, 85% of the foreign-born population spoke a language other than English at home. In 2012, about 40% of the nation's foreign-born population age five and older lived in Texas, California, and Illinois (United States Census Bureau, 2014). In Texas 91% of the foreign-born population spoke a language other than English.

The increasing number of students for whom English is an additional language is particularly significant. In attempting to correct the problem of these students who come

into the United States and speak little or no English, our existing educational system expects ELLs to acquire the English language as quickly as possible and often places no value on their native language or prior knowledge (Fry, 2008). No Child Left Behind (NCLB), the 2001 reauthorization of the Elementary and Secondary Education Act, has influenced policies and actions in each of the fifty states. NCLB requires all states to identify ELLs, measure their English proficiency, and include them in state testing programs that assess academic skills. In schools receiving Title I and Title III funds, NCLB calls for annual tests of reading and mathematics for all students at certain grade levels for the inclusion of ELLs in state accountability systems.

In Texas schools may exempt ELLs from achievement testing in English for up to three years, although they must assess English language proficiency annually with no exemption period. Both state and federal testing regulations require ELLs to be taught the same grade-level academic skills as their English-speaking peers. Title I, Part A, sec. 1111(a) (3) (C) of the Elementary and Secondary Education Act requires states to assess all ELLs in a valid and reliable manner and provide reasonable accommodations, including, to the extent practicable, assessments in the language and form that are most likely to yield accurate data about what students know and can do in academic content areas (Texas Education Agency, 2014). States are expected to include the assessments of ELLs in determining Adequate Yearly Progress (AYP). Each state must also set Annual Measurable Achievement Objectives (AMAO) for ELLs in the areas of English proficiency and performance on academic content (Bassiri & Allen, 2012). Improved education is key in improving ELLs' performance on these tests and narrowing the achievement gap (President Obama's Agenda, 2011).

Access to high quality education is necessary to empower students with the proper academic and critical thinking skills needed to succeed in a global economy. Over the next decade, nearly eight in 10 new job openings in the U.S. will require workforce training or postsecondary education. Of the 30 fastest growing occupations in America, 15 require a minimum of a four-year college degree. Economic progress and education achievement are linked (President Obama's Agenda, 2011); therefore, educating every student in our national school system must include both expectation of graduating from high school as well as additional preparation for success in post-secondary education.

Nationally, the ELL student population is expected to grow rapidly. The projected number of school-age children of immigrants will increase from 12.3 million in 2005 to 17.9 million in 2020, accounting for projected growth in the school-age population (Fry, 2008). A significant portion of these children of immigrants will likely require ELL services (Fry, 2008). One of our greatest educational challenges continues to be improving the education of ELLs, and the argument regarding the ways in which U.S. schools should educate non-English speaking students continues.

The major demographic shifts occurring in school districts across the country are prompting district administrators and teachers to introduce instructional services that will close the academic achievement gap for ELLs (Tellez & Waxman, 2005). The growing number of ELL students and continuing debate concerning the type of second language acquisition model that most effectively serves ELLs is part of the reason school districts are implementing many different second language acquisition models.

In Texas, under the bilingual umbrella, districts can serve the ELL population through dual language programs. Programs use different languages and include students

with varying characteristics (Gómez, Freeman, D., & Freeman, Y., 2005). Two basic dual language program types are the 90:10 and 50:50 models. In the 90:10 model, in kindergarten and first grade, 90% of the instructional day is devoted to content instruction in the L2 and 10% in English. In the 50:50 model, on the other hand, students receive one-half of their instruction in English and the other half in the L2 throughout the elementary grades. Although the school district of study offers both program models, this study will be based on a 50:50 two-way dual language model. Appendix D illustrates the language distribution by grade level and subject for this district's two-way dual language model.

Purpose of the Study

Dual language is a form of education in which students are taught literacy and content in two languages. The majority of the dual language programs in the United States teach English and Spanish; however, an increasing number of programs use a partner language other than Spanish such as Arabic, Chinese, French, Hawaiian, Japanese, or Korean. Dual language programs use the partner language for at least one half of the instructional day. These programs generally start in kindergarten or first grade and extend for at least five years, but some continue into middle school and high school. The goal of these programs is to reach the ability to speak, read, and write fluently in two languages (Gómez et. al, 2005).

Dual language programs are different from transitional bilingual programs. One of the major ways they differ is that the transitional bilingual program aims to transition students out of their native language (L1) into their second language (L2). This type of transition is sometimes referred to as subtractive bilingualism because the first language

is typically lost as the English or L2 is acquired and replaces the L1 (Lindholm-Leary, 2000). The students in this study followed the district's established dual language program. The language distribution by grade level of the students in the dual language program is illustrated in Appendix A, and the language distribution by grade level of the students in the transitional late-exit bilingual program is illustrated in Appendix B. These are the language models and language distributions by grade level supported by district policy.

The purpose of this study is to determine if there is a difference in mathematics and reading achievement between students served in a Dual Language/Two-Way Immersion program and those who are served in a Transitional, Late-Exit Bilingual program. The study compares students' academic achievement in mathematics and reading as measured by standardized test scores. The sample will include students who meet the following conditions within a school district: (a) students who were enrolled in Kindergarten during the 2006-2007 school year and participated in a Dual Language/Two-Way Immersion or Transitional, Late-Exit Bilingual program and (b) students who have an oral language proficiency of students who have Fluent Spanish Speakers (FSS) as determined by the students' Oral Language Proficiency Test (OLPT).

The intent of this study is to provide an additional way for district decision makers to analyze the academic achievement of the "traditional" bilingual programs and compare this academic achievement with student academic achievement in the dual language program. There is not much agreement on the most appropriate way to educate English Language Learner (ELL) students, leaving local district administrators to make these types of decisions according to the needs of their respective districts. In order to

make these types of decisions, it is important to determine if their current bilingual programs are meeting the needs of their ELL population or if a program such as dual language can provide the opportunity not only for bilingualism and biliteracy but also for higher academic achievement.

Significance of the Study

Across the nation, the number of non-English speaking students continues to rise. Approximately 10% of the U.S. student population is made up of ELLs. Texas alone has about 860,000 ELL students, which is approximately 17% of the total student population (IDRA, 2015). In Texas, school districts are measured on how well students perform across four areas: student academic achievement, student progress, closing performance gaps between low-achieving demographics, and post-secondary readiness (TEA, 2015). With only 1.5% of ELLs passing all end-of-course (EOC) exams, ELL students are among the most likely to drop out, and only 8% of ELLs are considered college ready (IDRA, 2015). Two factors that are of the utmost current importance include finding the most effective model to educate ELLs and also insuring the ability of ELLs to either enter the work force or be college ready (IDRA, 2015). The academic content background is critical for success in middle school and high school (Franquiz & Salinas, 2010). This study will focus on student academic results in the middle school years. The most effective methodology to conduct research on gap closure is longitudinal research that investigates the same group of students over time (Collier, 2004). Following the same students over a long period of time produces clear findings on gap closure and program effectiveness.

For Texas, the 2014 school year is the second year of a newly implemented state accountability system, and low academic performance of their ELL population can cause schools to receive a “needs improvement” accountability rating (TEA, 2015). The population that is estimated to become the majority of the nation’s labor force in less than 50 years has a limited educational success rate that restricts opportunities for advancement. The ELL population is also the population that will lead our nation into the 21st century.

In order to be better prepared for the challenges of this new century and to remain competitive, it is imperative we embrace the prior knowledge of this population and remove the barriers that limit the potential of ELLs. With millions of dollars continuing to be funneled into bilingual programs attempting to close the achievement gap between ELLs, data shows ELL drop-out rates are lower, but a gap in graduation and post-secondary education continues. The failure of existing approaches to meet the needs of ELL students consistently indicates a need for the development and implementation of research-based educational approaches to close the achievement gap for ELLs (Collier & Thomas, 2009; Faltis, 2011). The NCLB Act (2001) and the current state accountability system require that ELLs be tested annually to determine if a school has met AYP. School leaders must have researched information to select a program that is both cost effective and yields the highest academic results for ELLs. School district administrators need to be informed regarding statistics, growth patterns, assessment scores, and progress of their ELL students so that they are able to address the needs of these students and make appropriate program decisions regarding this population.

Methods

Data Selection. This quantitative study examines what differences exist in student academic achievement for students in a Dual Language/Two-Way Immersion program and those in a Transitional, Late-Exit Bilingual program. The research questions are:

- What differences exist in mathematics achievement between English Language Learners served through a Dual Language Two-Way Immersion program and those served through a Transitional, Late-Exit Bilingual program?
- What differences exist in reading achievement between English Language Learners served through a Dual Language Two-Way Immersion program and those served through a Transitional, Late-Exit Bilingual program?

The data set will be composed of ELL students who were enrolled in Kindergarten in the district under study during the 2006-2007 school year (in either the Dual Language/Two-Way program or the Transitional, Late-Exit Bilingual program), and who continued to be enrolled in the district under study in the 2014-2015 school year. Students meeting the selection criteria have been continuously enrolled in the district and served by the districts' bilingual program or dual language program. The district has established entry criteria, as illustrated in Appendix C, that students must meet in order to be accepted into the dual language program in kindergarten.

The students selected will be served in either the Dual Language/Two-Way immersion program or the Transitional, Late-Exit Bilingual program but not both. The student sample will include the students who met the following criteria:

- (a) were identified as ELL when they enrolled in Kindergarten during the 2006-2007 school year;

- (b) were enrolled in Kindergarten during the 2006-2007 school year and participated in a Dual Language/Two-Way Immersion or Transitional, Late-Exit Bilingual program;
- (c) have an oral language proficiency of Fluent Spanish Speakers (FSS) or Limited Spanish Speaker (LSS);
- (d) continue to be enrolled in the school district during the 2014-2015 school year, and
- (e) took the English version of the STAAR Reading and Mathematics test during the 2012, 2013, and 2014 administration.

Students not included in the study are students who:

- a) were not identified as ELL when they enrolled in Kindergarten during the 2006-2007 school year;
- (b) were enrolled in Kindergarten during the 2006-2007 school year and did not participate in a Dual Language/Two-Way Immersion or a Transitional, Late-Exit Bilingual program;
- (c) had oral language proficiency of Non-Spanish Speaker (NSS);
- (d) are not enrolled in the school district during the 2014-2015 school year, and
- (e) took the Spanish version of the STAAR Reading and Mathematics test during the 2012, 2013, and 2014 administration.

Existing archival data were requested from the district's Department of Research and Accountability to be used in determining answers to the research questions.

Analytical Technique. The independent sample t-test, effect size, and Chi Square analysis will be used to examine the academic performance of a Dual

Language/Two-Way immersion student cohort in the 2012, 2013, 2014 English reading and math STAAR compared to the academic performance of a Transitional, Late-Exit Bilingual student cohort in the 2012, 2013, 2014 English reading and math STAAR. The data will be processed and analyzed using Excel spreadsheets, Effect Size Calculator (Becker, 2000), the Calculator for the Chi-Square Test (Preacher, 2001), and SPSS Version 10.

Assumptions and Limitations

As with any study, there are a number of limitations associated with this study. The researcher assumes that (1) the late-exit Transitional bilingual program model was followed as stipulated by the school district, (2) the two-way dual language program was followed as stipulated by the school district, (3) the researcher is impartial and objective in the analysis of the data, (4) the data obtained from the school district is accurate, and (5) the researcher did not control for other confounding variables.

Data obtained in this study cannot be generalized adequately to a larger population. The student groups are selected from one school district and include only a small student sample size. The scope of the study was limited to STAAR reading and mathematics data acquired from one district's predetermined sample group. Beginning in the 2011-2012 school year, the Texas Education Agency (TEA) implemented the State of Texas Assessments of Academic Readiness (STAAR), which included new assessments in grades three through eight and EOC assessments. To meet legislative requirements, the new STAAR evaluation system differs significantly from the Texas Assessment of Knowledge and Skills (TAKS) evaluation system with the regard to rigor and test design.

Summary

The purpose of this study is to determine what differences exist in mathematics and reading achievement between students served in a Dual Language/Two-Way Immersion program and those who are served in a Transitional, Late-Exit Bilingual program by comparing students' academic achievement in mathematics and reading as measured by standardized tests in one Texas school district. The research study is divided into five chapters. The researcher introduces the topic to be investigated in Chapter One, including the study background and research questions the study will examine. Chapter Two contains a literature review. In Chapter Three, the methodology used in the research study will be delineated. Chapter Four will present answers to the research questions. Chapter five will contain the conclusion and recommendations for future study

Definition of Terms

The following terms will be used throughout the study. They were drawn from *The Common ELL Terms and Definitions* (Bardack, 2010).

Additive bilingualism: The opposite of subtractive bilingualism, additive bilingualism occurs in a context with no cost to or negative consequences for the home language. There is no attempt to replace the first language and culture.

Bilingual education: Academic programs that provide support to culturally and linguistically diverse students in their native language. The programs vary in their use of student's first language and the amount of years in which they transition students into full English instruction.

Bilingualism: The ability to communicate successfully in two languages, with the same relative degree of proficiency.

Biliteracy: The ability to communicate and comprehend thoughts and ideas using grammatical systems and vocabulary from two languages, as well as to write both languages.

Dual language/Two-Way Immersion: Dual language is a form of bilingual education in which students are taught literacy skills and content in two languages. These types of programs serve students proficient in English as well as students learning English.

ELL (English Language Learner): An individual who is in the process of actively acquiring English, and whose primary language is one other than English.

ESL (English as a Second Language): A term often used to designate students whose first language is not English; this term has become less common than the term ELL. Currently ESL is more likely to refer to an educational approach designed to support ELLs.

L1: An ELL's first language or native language. This term may be used to refer to persons who are speaking in their native language.

L2: An ELL's second language, often used in the context of "L2 student" to designate students who are nonnative speakers of a language.

SIOP (Sheltered Instruction Observation Protocol): An approach for teachers to integrate content and language instruction for students learning through a new language. Specifically, the SIOP is composed of 30 features grouped into eight main components.

Subtractive bilingualism: A form of bilingual education that encourages and develops an environment in which an ELL's second language is likely or intended to replace the first language.

Chapter II

Review of the Literature

Major demographic shifts are occurring in school districts across the United States as communities receive immigrants from countries around the world (Tellez & Waxman, 2005). ELLs are the most rapidly growing student population in United States elementary and secondary schools. This growth rate will continue throughout the next few decades (Sheng, Sheng, & Anderson, 2011). The debate about whether bilingual or English-only instruction is better for ELLs has been an ongoing topic of discussion among educators and non-educators for many years (Klee, Lynch, & Tarone, 1998). Texas is one of the last states to mandate and is certainly the largest. Other states with large ELL populations, including California and Arizona, have moved toward a more flexible immersion based model with encouraging results (Faltis, 2011).

School leaders, who play the central role in shaping the selection of a model for language acquisition, must understand the different variables that constrain their options in choosing among these models (Scanlan & Lopez, 2012). The Texas ELL population is going to keep growing and this continued growth is a problem of socioeconomics because many of the state's ELLs are also among its poorest and least educated. School districts need more tools at their disposal to target ELL needs. As dual language programs have emerged as one of several bilingual education models, it is important to understand the history behind bilingual education and the purpose each model was meant to serve for students.

A brief history of bilingual education in the United States lays the foundation for the literature review. A history of bilingual education and the types of bilingual programs

in Texas follows. The two types of bilingual programs on which the study is focused, transitional bilingual late-exit and dual immersion two-way, are then explained. Finally, literature on addressing the selection of program models is presented.

A Brief History of Bilingual Education in the United States

Incorporating ELLs into the U.S. school system has had a long educational and legal history. This history includes decisions about the availability and adequacy of special language education programs for ELLs. Bilingual education in the United States has gone through different stages and continues to be an ongoing controversy (Ovando, 2003). The type of bilingual education offered to ELLs and the views regarding the effectiveness of different program models have evolved over time.

Several approaches to ELL education have been implemented over the years with varying degrees of success reported. The different bilingual program models can be thought of as a continuum, depending on the relative importance that the program places on the ELLs' native language. The educational system in the United States continues the battle regarding the most effective way to educate ELLs since the first arrival of immigrants into the United States educational system. It is undeniable that political issues have both affected and shaped bilingual education.

The Permissive Period. The 1700's to the 1800's are characterized by what is known as the permissive period of bilingual education. During the second half of the 19th century, bilingual instruction was provided, mostly German-English, in some form in public and private schools. In Texas, on the other hand, the type of bilingual education offered was mostly Czech-English. A number of states passed laws that authorized bilingual education during this period (Ovando, 2003; Nieto, 2009).

Although bilingual education was not fully accepted, this time of allowing education in two languages gave the immigrants who came to the United States time to assimilate while they were simultaneously able to promote their language, religion, and cultural values. During this century, large number of immigrant communities promoted their language, religion, and culture (Ovando, 2003). A number of states passed laws that authorized bilingual education. This time period was characterized by its permissiveness regarding the establishment of bilingual education programs in schools, although bilingualism was not actively promoted during this time period (Ovando, 2003).

The Restrictive Period. The Restrictive period of the 1880's to the 1960's was a turning point in bilingual education (Ovando, 2003). During this time period, the government restricted Native Americans by issuing restrictive policies that confined them to their reservations. The American Protective Association was one of several organizations that promoted English-only instruction. By the 1880s, the Bureau of Indian Affairs implemented an English-only policy for Native Americans who sent their children to boarding schools. The policies did not succeed, but they did create a sense of superiority of the English language over other languages (Nieto, 2009).

During this time period, the predominant approach to educating language-minority students in the United States was the sink-or-swim method, also known as submersion (Nieto, 2009). The attitude of allowing bilingual education deteriorated when the country declared war on Germany during World War I. This declaration of war was responsible for the emphasis on English-only instruction. It was no longer acceptable to teach German as a foreign language. By 1923, the legislatures of 34 states had mandated English-only instruction in all private and public schools (Ovando, 2003). The lack of

access to a meaningful education hindered the possibility of full participation in society for the non-English speaking students and limited their opportunities to advance (Nieto, 2009). The debate concerning the instructional language to be used to educate ELLs continued.

The Period of Opportunity. The 1957 launch by Russia of Sputnik, the world's first artificial satellite, ushered in The Period of Opportunity for bilingual education, which stretched from the 1960's to the 1980's. The advances and progress of the time allowed the United States, once more, the opportunity to reflect on educational practices regarding foreign languages, mathematics, and science. Abilities in foreign languages, mathematics, and science were seen as essential for military, commercial, and diplomatic endeavors, and skills in these areas became high priorities for the national defense agenda during the Cold War period. A conscious effort resulted that promoted foreign language instruction and led to the creation of the National Defense Education Act in 1958. At the same time, English-only instruction denied the linguistic ability children from non-English backgrounds brought to schools in the United States in terms of their native languages (Ovando, 2003).

Fidel Castro's Cuban Revolution of 1959 also played a major role in bilingual education. The Cuban families who arrived in Florida mistakenly believed they would be able to return to their home country after a short period of time. For this reason, these families advocated for instruction in both English and Spanish for their children to prepare them to return to Cuba; therefore, the Cuban community offered dual language instruction to Cuban and English speaking children alike (Ovando, 2003).

The 1906 Naturalization Act was revoked by the 1965 Immigration and Nationality Act (INA), which eliminated racial criteria for admission and allowed for increased immigration especially for those entering the United States from Asia and Latin America. The INA also emphasized the goal of ‘family unification’ rather than the importance of occupational skills; therefore, increased immigration from Spanish-speaking countries, in particular, was encouraged (Ovando, 2003; Nieto, 2009).

The lack of access to a meaningful education prevented full participation in society for these non-English-speaking students and blocked their upward mobility. To make a meaningful education accessible to these non-English-speaking students, Congress passed the Bilingual Education Act of 1968, also known as Title VII of the Elementary and Secondary Education Act. This Bilingual Education Act has been considered the most important law in recognizing the rights of linguistic minorities in the history of the United States (Nieto, 2009; Ovando, 2003). Title VII represented the first bilingual and bicultural education program approved at the federal level. The goal of Title VII was to provide some instruction in the student’s native language to ease the transition into the mainstream classroom (Nieto, 2009).

In the early stages, the act did not provide a clear position for either strong or weak versions of bilingual education. School districts could receive federal funds to support educational programs (Ovando, 2003). The Bilingual Education Act (1968) marked a significant first step in moving away from sink-or-swim educational practices. The Act was controversial, and it obligated school districts that received federal funds to show both compliance with the law and that they actively addressed the educational needs of ELLs (Ovando, 2003; Nieto, 2009). For the first time in American educational

history, the federal government began initiatives to allow ELLs the opportunity to learn without first being proficient in English (Ovando, 2003).

The next important event in the rebirth of bilingual education was the 1974 Supreme Court case *Lau v. Nichols*. The Lau decision (1974) was the result of a class action suit representing 1,800 Chinese students who alleged discrimination on the grounds that they could not achieve academically because they did not understand the instruction of their English-speaking teachers. Basing their unanimous decision on the 1964 Civil Rights Act, the Supreme Court Justices concluded that the responsibility to overcome language barriers that impede full integration of students falls on the school boards and not on the parents or children; otherwise, there is no real access for these students to a meaningful education (Nieto, 2009). This ruling reinforced the mandate that it was the school district's responsibility to provide the necessary programs and accommodations to children who did not speak English. The Lau decision (1974) has had an enormous impact on the development of bilingual education in the U.S. The Lau verdict succeeded in abolishing the sink-or-swim practices of the past.

The Dismissive Period. The time period from the 1980's until the present has been concerned with the length of time students' native language should be used before transition to an all-English classroom environment. In The Dismissive Period, the battle against bilingual education has persisted at full force. The politics of language education during the administrations of Ronald Reagan and George H. W. Bush provided the anti-bilingual frame work of the 1980s and 1990s (Ovando, 2003). The use of Title VII funds was restricted to use in Maintenance Bilingual Education programs and the use of government funds shifted to English-only programs. The Improving America's School

Act of 1994 and Goals 2000 were reforms intended to raise the instructional and academic performance of ELLs. Under the Improving America's Schools Act of 1994, the Bilingual Education Act of 1968 was reauthorized with the main purpose of developing bilingual skills and promoting multicultural understanding. The result of this reauthorization was the promotion and establishment of developmental bilingual education programs, including two-way bilingual programs, which promote both bilingualism and biliteracy in the two languages of instruction. The early 1980's saw the dismantling of bilingual education programs by the Reagan administration in a challenge to the promising history of program development and research (Nieto, 2009). The challenge to bilingual education persisted throughout the administrations of Ronald Reagan and George H. W. Bush.

California's Proposition 227. The passing of California's Proposition 227 in 1998 required that English should be the main language used for instruction for all ELLs. It dismissed bilingual education and required teachers and school administrators to implement programs that violated the theory and basic principles for the effective education of ELLs. Although our nation had previously implemented dual language education programs, the nation became actively involved again in dual language education after the English Only amendment, Proposition 227, was passed in California. This amendment caused educators to look for a model that was effective for ELLs, legal, and accepted by the general public. Dual language fit that model. In Texas, where the second largest ELL population is located, the Texas Education Code continues to promote biliteracy. Section 29.053 in Subchapter B, establishes that any district with 20

or more limited English proficient students shall offer a second language acquisition program (Rolle & Castellanos, 2014).

No Child Left Behind (NCLB). The major focus of the passage of NCLB in 2001 was to close student achievement gaps by providing all children with a fair, equal, and significant opportunity to obtain a high-quality education (NCLB, 2001). NCLB also strengthened Title I accountability by requiring states to implement statewide accountability systems covering all public schools and students (“Executive Summary of the No Child Left Behind Act of 2001,” 2007). The federal NCLB (NCLB, 2001) law requires all ELLs to receive quality instruction for both learning English and grade-level academic content. NCLB allows for local district flexibility for choosing programs of instruction while demanding greater accountability for ELLs, English language, and academic progress (Cortez, Sorenson, & Coronado, 2012). NCLB was not the first piece of federal legislation to safeguard ELLs’ equal access to quality education; however, by setting accountability measures and penalties related to academic and language progress, NCLB brought the growing population of ELLs into focus for federal, state, and local policymakers, educators, and advocates (Flores, Batalova, & Fix, 2012). In addition, legislators through NCLB aimed to close the achievement gap by measuring AYP on test scores that have been disaggregated by student groups, such as Latinas/os and ELLs. In response to the legislation, educators have redirected their attention to programs that demonstrably close the achievement gap for ELLs and other disaggregated groups, while also increasing all students’ mastery of state educational standards (Thomas & Collier, 2003).

A Brief History of Bilingual Education in Texas

Alongside the history of bilingual education in the United States is a history of bilingual education in Texas. The “sink or swim” method remained the official pedagogical approach in Texas until the 1960’s, but there were some legal decisions that took place throughout the years that were important to the return of bilingual education programs in Texas.

In *United States v. Texas* (1971, 1981) the legal support for bilingual education was reinforced. This decision applied to the entire Texas public school system and was one of the most extensive desegregation orders in legal history. The decision required districts to create a plan and then implement language programs that would afford “all students equal educational opportunities as guaranteed by the Fourteenth Amendment and Title VI of the Civil Rights Act of 1964” (Texas State Historical Association, 2015, p. 4).

State funding for bilingual education was mostly a response to *United States v. Texas* where the state was ordered to provide bilingual and bicultural programs to Spanish-speaking school children (Cardenas, 1997). The ruling in *United States v. Texas* (1981) found that “the absence of a bilingual program constituted a denial of equal education opportunity for limited English proficient children in the state” (Cardenas, 1997, p. 159). *United States v. Texas* and *Lau v. Nichols* were prime catalysts for the expansion of bilingual and English as a second language (ESL) programs in the state (Texas State Historical Association, 2015).

The court order from *United States v. Texas* resulted in the enactment of Senate Bill 477 in 1981. Senate Bill 477 is perhaps one of the most comprehensive state laws to protect ELLs, and it continues to provide the legal foundation for bilingual and ESL

education in Texas (Cardenas, 1997). Chapter 89 of the Texas Administrative Code tracks the requirements of law as found in Senate Bill 477. These rules for implementation contain the minimum requirements for both bilingual education and ESL programs.

Castañeda v. Pickard (1981), which originated in Texas, also had a tremendous impact on the education of ELL students. In this case, a school district in Raymondville, Texas, was charged with violating the civil rights of ELLs under the Equal Education Opportunities Act of 1974. In response to this case, the Court of Appeals established a three-step test for determining whether school districts were taking “appropriate action” as required by the act for assessing programs serving culturally and linguistically diverse students: (a) The school program must be based in sound educational theory, (b) adequate resources and personnel must be evident in the implemented program, and (c) the school program must reflect sound practices and results, in language and in content areas such as mathematics, science, social studies, and language arts (Crawford 2004; Ovando, 2003).

The debate on funding to support programs has also shaped bilingual education in Texas. Specifically, the *San Antonio Independent School District v. Rodriguez* (1973) had serious implication for the funding of bilingual education. In this case, the plaintiffs charged that predominately minority schools received less funding than schools that served predominantly Caucasian students. This allegation is important because most ELL students come from low socioeconomic areas, attend low performing schools, and have limited access to resources outside of school as well (Bybee, Henderson, & Hinojosa, 2014). In House Bill 72 “bilingual education survived and was assigned a special program weight in the weighted pupil approach used to modify the foundation school

program” (Cardenas, 1997, p. 160). In spite of the increase in state funding, it was still evident that HB 72 did not entirely address the disparities between more advantaged school districts and those districts that are at a higher financial disadvantage (Cardenas, 1997). Texas current school funding controversy continues as does the challenge of determining the best model to use to educate ELLs.

Schools in Texas have a broad range of ELL students and of bilingual education models. The bilingual education history the state has undergone has had an impact on bilingual education in the United States, and due to the large number of ELL students enrolled in the state, Texas will continue to contribute to current and future policy debate on bilingual education (Faltis, 2011).

Bilingual Education Programs in Texas

The state of Texas has the second largest ELL population next to California. According to the 2013-2014 Texas Academic Performance Report (TAPR), over 899,000 students, an estimated 17.5% of the state’s student population is, “classified” ELL. Despite the history and never ending debate regarding bilingual education and English immersion only initiatives such as Proposition 227, Texas is now one of only four states requiring bilingual education (Faltis, 2011; Rolle & Castellanos, 2014).

Many types of bilingual education programs today include children with very different linguistic profiles. The TEC in Sec.29.503 specifies that “Each district with an enrollment of 20 or more students of limited English proficiency in any language classification in the same grade level shall offer a bilingual education or special language program”.

The State of Texas has four recognized bilingual education models and two ESL program models. Most programs offered are either transitional late-exit, transitional early-exit, two-way dual language, one-way dual language programs, ESL/content based, or ESL/pull-out (Brunner, 2011; Faltis, 2011; Rolle & Castellanos, 2014). The programs are (TEC §89.1210)

- *Transitional bilingual/early-exit* model serves ELLs and transfers the student to English-only instruction in mainstream no earlier than the end of Grade 1 or, if the student enrolls in school during or after Grade 1, no earlier than two years or later than five years after the student enrolls in school. *Transitional bilingual/late-exit* model extends the process of the transition from the first language (L1) to English (L2) over several years. A student is eligible to exit the program no earlier than six years or later than seven years after the student enrolls in school.
- *Dual language immersion/two-way* focuses on bilingualism and biliteracy and integrates students proficient in English with ELLs. This model provides instruction in both English and Spanish (or other language). The identified ELL student will transfer to English-only instruction no earlier than six years or later than seven years after the student enrolls in school.
- *Dual language immersion/one-way* is a biliteracy program model that serves only ELL students and provides instruction in both English and Spanish (or other language). The student transfers to English-only instruction no earlier than six years or later than seven years after student enrolls in school.
- *ESL/content-based* program model is an English program that serves only ELL students by providing a certified full-time teacher to provide supplementary

instruction for all content area instruction. The student transitions into the mainstream classroom in two to five years.

- *ESL/pull-out* program model is an English program that serves only ELL students by providing a certified part-time teacher to provide English language arts instruction exclusively while the student remains in mainstream content area classrooms. The student exits from the program between one to five years after the student enrolls in school.

Texas state law currently mandates bilingual education for elementary students, a choice of bilingual or ESL for middle school students, and ESL only for high school students. According to TEC Sec.29.503,

Each district that is required to offer bilingual education and special language programs under this section shall offer the following for students of limited English proficiency:

1. Bilingual education in kindergarten through the elementary grades;
2. Bilingual education, instruction in English as a second language, or other transitional language instruction approved by the agency in post-elementary grades through grade 8; and
3. Instruction in English as a second language in grades 9 through 12.

The type of program offered varies according to legal requirements, student needs, and the availability of staff and resources each district has. School district leaders may select from a variety of program options. Since bilingual education is mandatory in elementary schools in Texas, the transitional model is mostly used, but there are some districts that offer more than one type of bilingual program and/or ESL program.

Transitional bilingual late-exit and Dual language immersion

Transitional bilingual education models are widely used in Texas, although school districts have the option of implementing either a late-exit or early-exit model.

Transitional bilingual education is viewed as a remedial model because the purpose is to transition students into all English classrooms as quickly as possible (Palmer, Cancino Johnson & Chavez, 2006). A factor accounting for the continued existence of transitional programs is that elementary transitional programs have been found to be effective both in helping students learn sufficient English to transition to the all-English curriculum and in facilitating acceptable student performance on state academic assessments. On the other hand, the academic performance of students served through an ESL program at the secondary level has not been as successful (Cortez & Johnson, 2008). Collier and Thomas (2009), however, found that students in transitional bilingual programs demonstrate a need for more instructional support in the primary language than the support provided in most early-exit transitional bilingual classes.

Dual language bilingual programs have increased nationally and have experienced an increase in Texas due to the body of research showing positive academic and linguistic results for both ELLs and non-ELLs (Freeman, Freeman & Mercuri, 2005). As of 2011, a directory maintained by the Center for Applied Linguistics in Washington D.C. specifies there are 448 dual language immersion programs in 37 states across the United States. Across Texas, approximately 66,000 public school students are enrolled in two-way dual language programs. The percentage of students in dual language remains small compared to the number of students enrolled in the transitional bilingual model, but it is on the rise (Gómez et. al, 2010).

Dual language programs are different from transitional bilingual programs. One of the main differences is that the transitional bilingual program aims to transition students out of their native language (L1) into the second language (L2). Dual language programs, on the other hand, promote maintenance of the students' primary language while adding a second language in a context of additive bilingualism (Lindholm-Leary, 2000).

Two basic dual language program models are the 90:10 and 50:50 models. In the 50:50 model, students receive one-half of their instruction in English and the other one-half in the target language throughout the elementary grades. Literacy instruction varies slightly in this model. At some school sites, students learn to read first in their primary language and then add the target language at grade one or two while at other school sites, students learn to read in both languages simultaneously (Lindholm-Leary, 2000). This model is often used in areas with limited numbers of bilingual teachers. Teachers can team teach, and the bilingual teacher can teach in the language other than English to one group in the morning and the other group in the afternoon (or on alternate days or weeks). This alternation maximizes faculty language resources (Gómez et. al, 2005).

In the 90:10 model, on the other hand, 90% of the instructional day is devoted to content instruction in the target language and 10% in English in kindergarten and in first grade. All content instruction occurs in the target language, and English time is used to develop oral language proficiency and some pre-literacy skills. Reading instruction begins in the target language (e.g., Spanish) for both the target language-speaking and English-speaking students (Lindholm-Leary, 2000). Many schools have adopted this model placing an early emphasis on the language other than English to help compensate

for the dominant power of English outside the school context (Gómez, Freeman & Freeman, 2005).

There has been little uniformity in the two-way programs that have been implemented, and there are variations of time spent on each language (August & Hakuta, 1997; Calderon & Carreon, 2000; Calderon, Slavin & Sanchez, 2011). Some schools start by providing 90% of instruction in Spanish the first year and gradually add English until both languages are used 50% of classroom time. Others call for a 50:50 balance from Kindergarten on. Programs vary in their student selection, assessment, placement practices, and policies for admitting students. The largest variations exist with respect to the instructional practices for teaching in both languages (Calderon & Carreon, 2000; Lindholm-Leary, 2007). In Texas, for a district selecting the dual language immersion/two-way program, “whenever possible, 50% of the students in a program should be dominant English speakers and 50% of the students should be native speakers of the other language at the beginning of the program” (TEC 89.1210). Also, a minimum of 50% of instructional time must be provided in the language other than English, and the implementation should (1) begin at prekindergarten, kindergarten, or Grade 1; (2) continue without interruption incrementally through the elementary grades whenever possible; and (3) also consider expansion to middle school and high school whenever possible (TEC 89.1227).

Both bilingual and dual immersion language program models promote using the students’ L1 to acquire academic success as English is acquired. The two major differences between these models are the length of time before the student is transitioned and the percentage of time English is spoken in the classroom (Faltis, 2011).

Issues regarding language program selection

There is considerable controversy among policy makers, researchers, and educators regarding the most effective program that ensures the language, reading, and academic success of ELLs (Calderón et al., 2011). Schools that serve ELLs and other linguistically diverse children provide their best, and perhaps only, chance to achieve economic security (Calderón et al., 2011). Deciding the type of program that will best serve the student need is of great importance because of the impact it can have on student and overall campus academic performance. Students designated as ELLs tend to go to public schools that have low standardized test scores (Fry, 2007). In addition, ELLs are more likely to come from low-income families and to have parents with less education than their English-speaking counterparts (Sheng et al., 2011). Schools with this type of population cannot leave anything to chance and must capitalize on all of their financial assets (Calderón et al., 2011).

Different factors can shape decisions regarding the program design and the implementation process. The availability of bilingual faculty, bilingual materials, and funding, for example, play an important role in the decision process (Freeman et al., 2005). Determining the most effective way to educate incoming ELL students while maximizing funds provided by the state is important now and will continue to be significant in the future. Program cost is also an important factor, especially during a time of federal and state budget cuts. Program costs are especially important in Texas because an ELL student who has met exit criteria may continue receiving services, but the school district will not receive the bilingual education allotment reimbursement for that student (TEC 89.1210).

The most important aspect of any program is teacher training in effective bilingual education methodologies (Montague, 1997). In order to create new programs and maintain the quality of existing ones, those involved must consider who their students and teachers are (Freeman et al., 2005). As large numbers of ELLs enter American schools, K-12 general education teachers are discovering the need to learn for effective second language teaching methodologies. An estimated one in four children in America is from an immigrant family and lives in a household where a language other than English is spoken (Samson & Collins, 2012).

Given the continued growth of the ELL population, most, if not all, teachers can expect to have ELLs in their classroom and must be prepared to support these children (Calderon et al., 2011). A teacher who has not been trained in effective second language teaching methodologies is, therefore, at a disadvantage, and in order to maintain high program standards, teachers must attain bilingual and/or ESL certification (Montague, 1997). Teachers working in dual language programs vary both in their backgrounds and in their bilingual proficiency.

Some programs are started before instructional materials in each language have been purchased or have arrived, which means that literacy instruction in the minority language often depends on informal class or teacher-generated resources. It is even more essential for the success of a program that the teachers have high quality training and materials and that they are not expected to rely solely upon their bilingualism and creativity (Montague, 1997).

The requirements of NCLB (2001) currently motivate many important curriculum and instructional decisions (Lindholm-Leary, 2007). ELLs are included in accountability

systems. Although schools may exempt ELLs from achievement testing in English for up to three years, they must assess English language proficiency annually. In the current environment of high-stakes testing with consequences for schools that fail to meet expressed goals, gap-closure research can help clarify issues of student progress as a measure of program effectiveness (Cortez et al., 2012). Bilingual programs are not just about acquiring languages; rather, bilingual programs are also an opportunity for bilingual learners to develop transcultural and multilingual skills and identities (Palmer, 2011)

In 1981, Cummins concluded that it took at least five to seven years for ELLs to achieve academic norms and perform comparably to their English-speaking classmates. Collier (1987) conducted further research and found that new arrivals at the age of eight or younger would take seven to ten years to close the academic gap when being instructed exclusively in English without native language support. In a longitudinal study conducted by Collier (2004), students in dual language programs led to grade-level and above-grade-level achievement in second language performance in six to seven years. Some bilingual programs labeled transitional late-exit extend services in the ELL's primary language through the end of elementary school. The analysis conducted by Collier & Thomas (2009) did not include the late-exit model but does state that the late-exit model has the potential for achievement at a level similar to one-way dual language education. Greene (1998) stated that children limited English proficiency who are taught using their native language perform significantly better on standardized tests than similar children who are taught in English only. Krashen and Brown (2005) discovered that the faster students acquired language proficiency, the faster they improved academically.

Although some flexibility exists regarding the implementation and curriculum choices of bilingual models, Texas requires school districts to report ELL's academic progress and proficiency in either language. Dual immersion programs must collect a full range of data to determine program impact on student academic success. Some indicators of success may include scores on statewide student assessments in English, statewide student assessments in Spanish (if appropriate), norm-referenced standardized achievement tests in both languages, and/or language proficiency tests in both languages (TEC 89.1267).

While some schools report successful student outcomes in bilingual education, the results continue to create debate regarding the type of educational program most effective in promoting academic achievement in ELLs (Scanlan & Lopez, 2012). Transitional bilingual programs demonstrate that ELL students need more effective instructional support through their L1 for a longer time until they reach grade level achievement in L2 (Collier & Thomas, 2009). It also holds that well-designed and implemented developmental bilingual approaches support language acquisition in both English and Spanish more effectively than transitional bilingual approaches (Scanlan & Lopez, 2012). A dual language program is not required under Texas state policies for bilingual education, but it is an acceptable approach to educating ELL students. The dual language program has the same components as the transitional bilingual education program (TEA, 2006).

Determining the most effective way to educate incoming ELLs while maximizing the "current available" funds the state provides is important now and will remain a vital concern. This investigation of a particular school district in Texas will examine whether

or not a difference exists in student academic achievement for students in a Dual Language/Two-Way Immersion program when compared with students in a Transitional, Late-Exit Bilingual programs.

Chapter III

Methods

Purpose

The purpose of this study is to determine what differences exist in mathematics and reading achievement between students served in a Dual Language/Two-Way Immersion program and those who are served in a Transitional, Late-Exit Bilingual program by comparing students' academic achievement in mathematics and reading as measured by the State of Texas Assessment of Academic Readiness (STAAR) standardized test. Specifically, this study will compare the 2013, 2014, and 2015 English reading and mathematics STAAR data of a cohort of students who participated in a Dual Language/Two-Way immersion and a cohort of students who participated in a Transitional, Late-Exit Bilingual program. This chapter includes a description of the setting, population, research questions, research design, participants, instrumentation, data analysis, procedure and time frame, and limitations of the study.

Setting

The data used for this study included the 2012, 5th grade; 2013, 6th grade; and the 2014, 7th grade English reading and mathematics STAAR data of a cohort of students in a Dual Language Two-Way Immersion program and a cohort of students in a Transitional, Late-Exit Bilingual program. The Title I schools selected for this study were the schools that offered both types of bilingual programs on their campus and had a cohort of Dual Language/Two-Way Immersion students enrolled in at least 7th grade in the 2013-2014 school year. The school district gradually added the dual language program in selected campuses and began with their first campus offering dual language in the 2003-2004

school year. Today the district offers dual language in 6 of the 36 elementary campuses, 1 of 5 middle schools, 2 of 6 Intermediates, and 1 of 6 high schools.

For the purpose of this study, the student cohorts were selected from the elementary schools that offered both the dual language program and the bilingual program.

Elementary schools in the district that did not offer both programs were excluded from the study. As a result, the study's cohorts were selected from two elementary campuses.

These schools are representative of the district's demographics. Bilingual program students may take the Reading and Mathematics STAAR in Spanish or in English. For the purpose of this study, however, only students who took the English STAAR in Reading and Mathematics in the 2011-2012 5th grade, 2012-2013 6th grade, and the 2013-2014 7th grade met the selection criterion for this study.

Population

The suburban school district under study is located near a large urban area in the southwest, and covers 85.5 square miles of land. The ethnic composition of the district continues to shift. The district's student population in 2013-14 was 82.3% Latinas/os, 7% Caucasian, 7% African- American and 3.7% Asian/Other/Two or more. At the same time, for the 2013-2014 school year, the number of economically disadvantaged students in the district of study increased to 43,332 students or 79.5% of the student population.

The district mainly serves the ELL population through a Transitional, Late-Exit Bilingual program, ESL program for non-Spanish speakers, and a sheltered instruction program in the secondary grades. In the 2003-2004 school year, the district implemented its first 50:50 Dual Language/Two-Way Immersion program and offered it on two of the 35 elementary campuses in the district. In the district under study, students in the dual

language program are taught using the 50:50 model. Students receive one-half of their instruction in English and one-half in the target language throughout the elementary and secondary years. In Kindergarten, students are taught Language Arts and Mathematics in their native language. From 1st through 5th grade, students are mixed all day and receive literacy instruction in both Spanish and English. One of the main goals of the program is to promote high levels of academic achievement in our students.

In addition to dual language/two-way immersion, the district also offers a transitional/late-exit bilingual program. Most of the ELL student population is served by this program model. The district currently offers two-way dual language programs on six elementary campuses, one middle school campus, two intermediate school campuses, and one high school campus. Although the school district offers both one-way immersion and two-way immersion program models, this study will be based on a 50:50 two-way dual language model and will compare student academic performance in Reading and in Mathematics with student academic performance in Reading and in Mathematics for a Transitional, Late-Exit Bilingual program model.

Research Questions

The purpose of this study is to determine if there is a difference in mathematics and reading achievement between students served in a Dual Language/Two-Way Immersion program and those who are served in a Transitional, Late-Exit Bilingual program by comparing students' academic achievement in mathematics and reading as measured by standardized tests.

- What differences exist in mathematics achievement between English Language Learners served through a Dual Language Two-Way Immersion program and those served through a Transitional, Late-Exit Bilingual program?
- What differences exist in reading achievement between English Language Learners served through a Dual Language Two-Way Immersion program and those served through a Transitional, Late-Exit Bilingual program?

Research Design

The research method for this study is quantitative and focuses only on archival data. Three type of analysis will be conducted to compare the 2012, 2013, and 2014 English reading and mathematics STAAR data of a cohort of students who participated in a Dual Language/Two-Way immersion and a cohort of students who participated in a Transitional, Late-Exit Bilingual program to determine the difference in academic achievement of students served in a Dual Language/Two-Way immersion program when compared with students served in a Transitional, Late-Exit Bilingual program.

Participants

The participants in this study are students who were enrolled in Kindergarten in the school district during the 2006-2007 school year and who are still enrolled in the district in the 2014-2015 school year. Participants are required to have been continuously enrolled in the district and served by either the districts' bilingual program or the dual language program. The data evaluated consisted of archival STAAR data from students who were in the Dual Language/Two-Way immersion program and archival STAAR data from students who participated in the Transitional, Late-Exit Bilingual program.

Existing archival data was requested from the district's Department of Research and Accountability to be used to respond to the study's research questions. The students selected participated in either the Dual Language/Two-Way immersion program or the Transitional, Late-Exit Bilingual program but not in both programs. Participating students met the following criteria:

- (a) were identified as ELL when they enrolled in Kindergarten during the 2006-2007 school year
- (b) were enrolled in Kindergarten during the 2006-2007 school year and participated in a Dual Language/Two-Way Immersion or Transitional, Late-Exit Bilingual program and
- (c) who have an oral language proficiency of Fluent Spanish Speakers (FSS) or Limited Spanish Speaker (LSS)
- (d) who continue to be enrolled in the school district during the 2014-2015 school year
- (e) who took the English version of the STAAR Reading and Math test during the 2012, 2013, and 2014 administration.

Students not included in the study are students who:

- a) were not identified as ELL when they enrolled in Kinder during the 2006-2007 school year
- (b) were enrolled in Kindergarten during the 2006-2007 school year and did not participate in a Dual Language/Two-Way Immersion or a Transitional, Late-Exit Bilingual program and
- (c) had oral language proficiency of Non-Spanish Speaker (NSS)

- (d) are not enrolled in the school district during the 2014-2015 school year
- (e) took the Spanish version of the STAAR Reading and Math test during the 2012, 2013, and 2014 administration.

The study will use data from 28 students for Dual Language/Two-Way Immersion and 28 student for Transitional, Late-Exit bilingual program from two campuses. A request for data was submitted to the district's Department of Research and Evaluation. The study used data from 24 students in the Dual Language/Two-Way Immersion program and 28 students in the Transitional, Late-Exit bilingual program from two campuses. A request for data to be analyzed in this study was submitted to the district's Department of Research and Evaluation. Of the two campuses students were selected from, 88% of the total student group began elementary in School A and 13% in School B. For the Transitional, Late-Exit bilingual program, 75% of the total student group began elementary in School A and 25% in School B. Table 1 represents the demographic make-up of the total student group. The two groups are generally equivalent; however, they did differ substantially in the percentage of At Risk students. In addition, the dual language students had a higher percentage of fluent Spanish speakers and the transitional bilingual students had a higher percentage of limited Spanish speakers.

Table 1

Demographics

	Dual Language	Transitional Late Exit
	<i>N</i> = 24	<i>N</i> = 28
Gender		
Male	54%	50%
Female	46%	50%
Race/Ethnicity		
Hispanic	100%	100%
Socioeconomic Status		
Economically Disadvantaged	83%	86%
Special Populations		
Special Education	4%	4%
504	4%	14%
At Risk	25%	46%
Oral Language Proficiency		
Fluent Spanish Speaker (FSS)	71%	11%
Limited Spanish Speaker (LSS)	29%	86%

Note: Often students protected under Section 504 have “hidden disabilities”, which include low vision, poor hearing, heart disease, or a chronic illness, such as cancer (TEA, 2014). AT-RISK-INDICATOR-CODE indicates whether a student is currently identified as at-risk of dropping out of school using state-defined criteria only (TEC §29.081, Compensatory and Accelerated Instruction) (PEIMS, 2014).

Instrumentation

The instrument being used to assess the reading and math academic performance of the sample groups is STAAR. In the 2011-2012 school year, the Texas Education Agency (TEA) implemented the STAAR program for the first time, including new assessments in grades 3-8 and several high school EOC assessments. To meet legislative requirements, the STAAR program differs from the TAKS program, specifically with regard to rigor and test design. The new assessment program assesses content and skills from TEKS at a greater depth and higher level of cognitive complexity (Texas Education Agency, 2012).

Performance standards were set using data gathered from studies that link year-to-year performance from grades 3-8. Expectations for student performance on STAAR were raised to achieve the goal of graduating students who are college and career ready. The performance standards will be reviewed every three years and, if necessary, adjusted to ensure that the assessments maintain a high level of rigor. The basic score on any test is the raw score, which is the number of items correct. Unlike raw scores, scale scores allow direct comparisons of student performance between specific sets of test questions from different administrations. The scale score also takes into account the difficulty level of the specific set of questions. For the purpose of this study the STAAR scale score cuts for New Phase-in Schedule used will be (TEA, 2012):

Mathematics:

- Level II: Satisfactory Phase-in 1, Grade 5 scale score 1489 = 26 Raw Score (52%)
- Level II: Satisfactory Phase-in 1, Grade 6 scale score 1509 = 22 Raw Score (42%)
- Level II: Satisfactory Phase-in 1, Grade 8 scale score 1583 = 22 Raw Score (39%)

Reading:

- Level II: Satisfactory Phase-in 1, Grade 5 scale score 1458 = 25 Raw Score (54%)
- Level II: Satisfactory Phase-in 1, Grade 6 scale score 1504 = 27 Raw Score (56%)
- Level II: Satisfactory Phase-in 1, Grade 7 scale score 1556 = 27 Raw Score (54%)

Data Analysis

There were several factors that were taken into consideration in selecting the student groups. The most effective methodology to conduct research on gap closure is longitudinal research that investigates the same group of students over time (Collier, 2004). Following the same students over a long period of time produces clear findings on gap closure and program effectiveness. In addition, students in dual language programs led to grade-level and above-grade-level achievement in six to seven years (Collier, 2004). Also, first language school whether in home country or in the United States has been confirmed to play a key role in determining successful academic achievement in the L2. The advantaged new arrivals who have had some schooling in language one are the ones that will reach L2 academic success faster comparable to native English speakers (Cummins, 1981). Once students who met the selection criteria were identified, data was collected and analyzed for each group. Comparisons were made between the two program groups regarding academic performance on STAAR between the ELLs served in the Dual Language/Two-Way immersion program and the ELLs who participated in the Transitional, Late-Exit Bilingual program. Additionally, comparisons were made between each group and the Level I and Level II STAAR state scale scores.

The t-test procedure performs t-tests on one sample, on two samples, and on paired observations. The single-sample t-test compares the mean of the sample, the

academic performance of Dual Language/Two-Way immersion student cohort in the 2012, 2013, and 2014 English reading and mathematics STAAR and the academic performance of a Transitional, Late-Exit Bilingual student cohort in the 2012, 2013, and 2014 English reading and mathematics STAAR, to a given supplied number, Reading and Mathematics STAAR Scale Scores. The dependent-sample t-test compares the difference in the means from the two variables to a given number (usually 0) while taking into account the fact that the scores are not independent. The independent samples t-test compares the difference in the means from the two groups to a given value (usually 0). In other words, it tests whether the difference in the means is 0.

In addition, a Chi Square analysis was used to determine if there were significant differences with the dependent variable (2012, 2013, 2014 Reading and Mathematics STAAR test) in students meeting the STAAR Level II Phase-in 1, STAAR Level II Final standard for the independent variable with two groups (Dual Language/Two-Way Immersion and Transitional, Late-Exit bilingual program).

In order to determine if there was a difference in mathematics and reading achievement between students served in a Dual Language/Two-Way Immersion program and those who are served in a Transitional, Late-Exit Bilingual program three statistical analyses were conducted. “The independent samples t-test compares the difference in the means from the two groups to a given value (usually 0). In other words, it tests whether the difference in the means is 0” (UCLA: Statistical Consulting Group, 2015, para1). For the purpose of this study, the independent samples t-test analysis compared the difference in means of the academic performance of Dual Language/Two-Way immersion student cohort in the 2012, 2013, 2014 English reading and mathematics STAAR to the academic

performance of a Transitional, Late-Exit Bilingual student cohort in the 2012, 2013, 2014 English reading and mathematics STAAR.

$$t = \frac{\bar{x}_1}{\sqrt{\frac{s_1^2}{N_1}}} + \frac{\bar{x}_2}{\sqrt{\frac{s_2^2}{N_2}}}$$

The t-test has the following assumptions:

- 1) Each score (or difference score for paired t-test) must be independent of all other scores.
- 2) The data must be sampled from a normally distributed population (or populations if it is a two-sample test).
- 3) For two-sample tests, the two populations must have equal variances.

For the purpose of this study, the independent samples t-test analysis compared the difference in means of the academic performance of Dual Language/Two-Way immersion student cohort in the 2012, 2013, 2014 English reading and mathematics STAAR to the academic performance of a Transitional, Late-Exit Bilingual student cohort in the 2012, 2013, 2014 English reading and mathematics STAAR obtained by subtracting one mean from the other and dividing by the pooled standard deviation.

$$\text{Cohen's } d = \frac{M^1 - M^2}{S_{pooled}}$$

$$\text{where } S_{pooled} = \sqrt{\frac{[(s_1^2 + s_2^2)]}{2}}$$

In addition, a Chi Square analysis was used to determine if there were significant differences between the two groups (Dual Language/Two-Way Immersion and Transitional, Late-Exit bilingual program) in terms of passing rates for the 2012, 2013, and 2014 Reading and Mathematics STAAR tests.

Chi-square tests of independence and goodness-of-fit are used to detect group differences using frequency (count) data. A chi-square incorporating *Yates' correction for continuity* is often employed to improve the accuracy of the null-condition sampling distribution of chi-square. Frequencies less than 5 are usually considered acceptable if Yates' correction is employed. (Preacher, 2001, para.3)

$$x^2 = \sum \frac{(O - E)^2}{E}$$

$$x^2_{(yates)} = \frac{N \left(|ad - bc| - \frac{N}{2} \right)^2}{(a + b)(c + d)(a + c)(b + d)}$$

The chi-square test has the following assumptions:

- 1) The sample data is a random sampling.
- 2) A sample with a sufficient size is assumed.
- 3) Adequate cell counts are expected. If the common rule of 5 or more on a cell is not met, Yates's Correction is applied.
- 4) The observations are assumed to be independent of each other.

All test results were considered significant at the $p \leq .05$ level, meaning a very low (i.e. $\leq 5\%$) likelihood of incorrectly rejecting the null hypothesis.

The data set were composed of ELL students who were enrolled in Kindergarten in the district of study during the 2006-2007 school year (Dual Language/Two-Way or Transitional, Late-Exit Bilingual program), and who continued to be enrolled in the district of study in the 2014-2015 school year. Students meeting the selection criteria were required to have been continuously enrolled in the district and served in the districts' bilingual program or dual language program. There are a total of two

elementary campuses out of the 35 total elementary campuses in the district of study that met the selection criteria required for the study. There were a total of 116 ELL students enrolled in Kindergarten in both campuses during 2006-2007. The data were processed and analyzed using Excel spreadsheets, Effect Size Calculator (Becker, 2000), the Calculator for the Chi-Square Test (Preacher, 2001), and SPSS Version 10.

The student cohort participants were selected from the elementary schools that offered both the dual language program and the bilingual program during the years required for this study. All elementary schools in the district that did not offer both programs were excluded from the study; as a result, the study's cohorts were selected from two elementary campuses. The schools are representative of the district's demographics. Students participating in bilingual programs may take the Reading and Mathematics STAAR in Spanish but, for the purpose of this study, only the scores of students who took Reading and Mathematics STAAR in English in 2012, 2013, and 2014 are included in the study.

The study used data from 24 students for the Dual Language/Two-Way Immersion program and 28 students for the Transitional, Late-Exit bilingual program from two campuses. A request for data was submitted to the district's Research and Evaluation office and was used for the purpose of this study. Of the two campuses students were selected from, 88% of the total student group began elementary in School A and 13% in School B. For the Transitional, Late-Exit bilingual program, 75% of the total student group began elementary in School A and 25% in School B. Table 1 represents the demographic makeup of the total student group.

Procedure and Timeframe

This study is quantitative and focuses on archival district data between 2012 and 2014. A data request was submitted to the district's Director of Research and Accountability. All data was retrieved from the district's student management system, Chancery. Once data were received, personal information specific to individual students was removed by the researcher in order to protect student confidentiality.

Limitations

There are a number of limitations considered in the analysis of the data. The study was limited to one school district. Although the district currently has six elementary campuses offering the Dual Language/Two-Way Immersion program, only two campuses met the selection criteria for this study. For the transitional, late-exit sample group and the dual language/two-way immersion sample group, only students who satisfy all selection criteria were included.

In addition, only quantitative data were considered, and there are several qualitative factors that can possibly affect student academic performance on STAAR. The factors may include but are not limited to campus leadership style, program fidelity, parental involvement, staff development, instructional resources, and student intervention efforts. The STAAR assessment is a standardized test and the scale score alone does not reflect the level of student success in its entirety. Although this study did not consider other confounds, and the two groups are generally equivalent; they did differ substantially in the percentage of At Risk students. Students that are labeled At Risk are associated with lower academic performance (McDonald, 2002). In addition, the dual language students had a higher percentage of fluent Spanish speakers and the transitional

bilingual students had a higher percentage of limited Spanish speakers. First language school whether in home country or the United States has been confirmed to be play a key role in determining successful academic achievement (Cummins, 1981). Finally, students in the dual language program had to meet entrance criteria before being accepted into the program, and students in the district's transitional-bilingual late exit program are placed in the program according to TEC guidelines.

Chapter IV

Discussion

Restatement of the Problem

The purpose of this study is to determine if there is a difference in mathematics and reading achievement between students served in a Dual Language/Two-Way Immersion program and those who are served in a Transitional, Late-Exit Bilingual program by comparing students' academic achievement in mathematics and reading as measured by the State of Texas Assessment of Academic Readiness (STAAR) standardized test. Specifically, this study compared the 2012, 2013, and 2014 English reading and mathematics STAAR data of a cohort of students that participated in a Dual Language/Two-Way immersion and a cohort of students that participated in the Transitional, Late-Exit Bilingual program.

Results

This study focused on answering two research questions:

- Is there a difference in mathematics achievement between, English Language Learners served through a Dual Language Two-Way Immersion program and those served through a Transitional, Late-Exit Bilingual program?
- Is there a difference in reading achievement between English Language Learners served through a Dual Language Two-Way Immersion program and those served through a Transitional, Late-Exit Bilingual program?

The data were analyzed and reported in two categories. The first analysis determined the student score averages in each cohort for reading and mathematics in 5th, 6th, and 7th grade STAAR first administration. Then, the score average and standard

deviation were compared to determine if a statistically significant difference existed between the two groups' academic performance in STAAR reading and mathematics.

Additionally, the student sample size included in the analysis ended up being much smaller due to the different selection criteria required in order to account for variability that would make research findings more robust.

Table 2 represents the total number of students in each group by subject area.

Table 2

Total Participants by Subject/Grade

Subject	Grade	Dual Language	Transitional LE
		N	N
Reading	5th	19	25
Reading	6 th	24	28
Reading	7th	24	28
Mathematics	5th	21	26
Mathematics	6th	24	25
Mathematics	8 th *	24	12

Note: * Students that took the 8th grade STAAR

For the purpose of this study, the independent samples t-test analysis compared the difference in means of the academic performance of Dual Language/Two-Way immersion student cohort in the 2012, 2013, 2014 English reading and mathematics STAAR to the academic performance of a Transitional, Late-Exit Bilingual student cohort in the 2012, 2013, 2014 English reading and mathematics STAAR. The effect size was also be used to determine the standardized difference between the two means. In addition, a Chi Square analysis was used to determine if there were significant

differences between the two groups in terms of passing rates for the 2012, 2013, and 2014 Reading and Mathematics STAAR tests. The data were processed and analyzed using Excel spreadsheets, Effect Size Calculator (Becker, 2000), the Calculator for the Chi-Square Test (Preacher, 2001), and SPSS Version 10.

The data were then analyzed to determine the passing and failure percentage for each group. For the purpose of this study, this was done using the STAAR scale score cuts for New Phase-in Schedule in Reading and Mathematics (Texas Education Agency, 2014).

- Reading (English):
 - Level II: Satisfactory Phase-in 1, Grade 5 scale score 1458
 - Level II: Satisfactory Phase-in 1, Grade 6 scale score 1504
 - Level II: Satisfactory Phase-in 1, Grade 7 scale score 1556
- Mathematics (English) scale score:
 - Level II: Satisfactory Phase-in 1, Grade 5 scale score 1489
 - Level II: Satisfactory Phase-in 1, Grade 6 scale score 1509
 - Level II: Satisfactory Phase-in 1, Grade 8 scale score 1583

Reading

Table 3 presents the Reading mean and standard deviation for each group.

Table 3

Reading Means and Standard Deviations

Grade	Dual Language			Transitional LE		
	Mean	<i>SD</i>	<i>N</i>	Mean	<i>SD</i>	<i>N</i>
5th	1618.94	98.60	19	1515.64	92.18	25
6th	1618.95	98.60	24	1580.71	92.18	28
7th	1692.41	88.57	24	1616.46	117.96	28

To test the assumptions of the *t*-test, preliminary analyses were conducted. The independence of observations assumption was met for all analyses because students took the STAAR test independently. The normal distribution assumption was analyzed by examining a histogram of the scores, calculating the Shapiro-Wilk statistic, and examining a normal Q-Q plot of scores. In all cases, the analyses indicated that the data approximated normal distributions, with the exception of 7th grade reading, which was somewhat skewed. However, in the event of a small departure from normality, the *t*-test remains robust and can still be used (Nordstokke & Zumbo, 2007).

The homogeneity of variances assumption was analyzed with a nonparametric Levene's test (Nordstokke & Zumbo, 2007; Nordstokk, Zumbo, Cairns, & Saklofske, 2011), which is the most powerful test of homogeneity of variance and is robust against violations of the normal distribution assumption. When this Levene's test is not significant, a *t*-test assuming equal variances can be used. In contrast, when this

Levene's test is significant, the variances are assumed to be unequal, a *t*-test assuming unequal variances is used. This non-parametric Levene's test involves "(i) pooling the data and replacing the original scores by their ranks and then (ii) separating the data back into their groups and (iii) applying the mean-based Levene test (T2) to the ranks" (Nordstokke & Zumbo, 2007, p.11-12).

Levene's test of the 5th, 6th, and 7th grade Reading variances was not significant, indicating equal variances: 5th grade Reading $F(1, 42) = 1.92, p = .17$; 6th grade Reading $F(1, 50) = .96, p = .333$, and 7th grade Reading $F(1, 50) = .89, p = .35$.

A *t*-test assuming equal variances examining the difference between Dual Language Two-Way Immersion student group and the Transitional, Late-Exit Bilingual program in:

- 5th grade Reading was significant and large, $t(42) = 3.57, p = .001, d = 1.08$.
- 6th grade Reading was significant and medium, $t(50) = 2.10, p = .041, d = .56$.
- 7th grade Reading was significant and medium, $t(50) = 2.59, p = .013, d = .73$.

In summary, at all three years the Dual Language Two-Way Immersion student group outperformed the Transitional, Late-Exit Bilingual group in Reading. Table 4 represents the Reading Pass/Fail percentages.

Table 4

Reading Pass/Fail Percentages

Grade	Dual Language			Transitional LE		
	% Pass	% Fail	<i>N</i> =	% Pass	% Fail	<i>N</i> =
5th	100	0	19	72	28	25
6th	92	8	24	68	32	28
7th	96	4	24	68	32	28

The pass rate among students in:

- 5th grade Dual Language Two-Way Immersion was significantly higher than the pass rate among students in the Transitional, Late-Exit Bilingual program, $\chi^2 = 4.40$, $p = .04$.
- 6th grade Dual Language Two-Way Immersion was marginally significantly higher than the pass rate among students in the Transitional, Late-Exit Bilingual program, $\chi^2 = 3.08$, $p = .08$.
- 7th grade Dual Language Two-Way Immersion was significantly higher for the than the pass rate among students in the Transitional, Late-Exit Bilingual program, $\chi^2 = 4.84$, $p = .03$.

Mathematics

Table 5 represents the Mathematics mean and standard deviation for each group.

Table 5

Mathematics Means and Standard Deviations

Grade	Dual Language			Transitional LE		
	Mean	SD	N	Mean	SD	N
5 th	1630.67	67.09	21	1631.54	142.80	26
6 th	1687.00	67.09	24	1673.32	142.81	25
7 th	1719.75	111.38	24	1757.58	120.82	12
(8 th grade STAAR)						

Levene's test of the 5th and 6th grade Mathematics variances was not significant, indicating equal variances: 5th grade Mathematics $F(1, 45) = 1.40, p = .24$ and 6th grade Mathematics $F(1, 50) = .88, p = .35$. The Levene's test for the 7th grade Mathematics variances was significant, indicating unequal variances: $F(1, 34) = 7.82, p = .008$.

A *t*-test assuming equal variances examining the difference between Dual Language Two-Way Immersion student group and the Transitional, Late-Exit Bilingual program in:

- 5th grade Mathematics was not significant, $t(45) = .03, p = .98, d = .001$.
- 6th grade Mathematics was not significant, $t(50) = .30, p = .77, d = .08$

A *t*-test assuming unequal variances examining the difference between Dual Language Two-Way Immersion student group and the Transitional, Late-Exit Bilingual program in:

- 7th grade Mathematics was not significant, $t(21) = .91, p = .37, d = .33$

In summary, in 5th and 6th grade Mathematics there is not a significant difference between the Dual Language Two-Way Immersion student group and the Transitional, Late-Exit Bilingual group in Mathematics. However, there was significant and small difference in the Bilingual group's higher academic performance than the Dual Language student group.

Table 6 represents the Mathematics Pass/Fail percentages.

Table 6

Mathematics Pass/Fail Percentages

Grade	Dual Language			Transitional LE		
	% Pass	% Fail	<i>N</i> =	% Pass	% Fail	<i>N</i> =
5th	100	0	21	92	8	26
6th	92	8	24	82	18	25
7 th	92	8	24	92	8	12

Note: 7th grade students that took the 8th grade STAAR exam.

The Mathematics pass rate among students in:

- 5th grade Dual Language Two-Way Immersion was not significant compared to the pass rate among students in the Transitional, Late-Exit Bilingual program, $\chi^2 = .33, p = .57$
- 6th grade Dual Language Two-Way Immersion was not significant compared to the pass rate among students in the Transitional, Late-Exit Bilingual program, $\chi^2 = .36, p = .55$
- 7th grade students that took the 8th grade Mathematics STAAR exam in Dual Language Two-Way Immersion was not significant compared to the

pass rate among students in the Transitional, Late-Exit Bilingual program,

$$\chi^2 = .41, p = .52.$$

In summary, there was a connection between higher scores in Reading and the type of language program students participated in. There was a significant difference in how the two groups performed in Reading, which could be related to the type of language program instruction received. However, in Mathematics, there was no evidence for a relationship between the type of language program the students participated in and their Mathematics academic performance.

Chapter V

Discussion

Introduction

Incorporating English language learners (ELLs) into the U.S. school system has had a long educational and legal history. The history includes decisions about the availability and how adequate language acquisition programs are for ELLs (Flores, Batalova, & Fix, 2012). The student population in United States elementary and secondary schools will continue to be culturally and linguistically diverse for decades to come. ELLs who have been educated exclusively in the United States are still not adequately proficient in English to be reclassified as Fluent English Speakers (Gil & Bardack, 2010). They also have lower achievement scores and do not perform as high as their non-ELL peers. In 2009, a particular concern noted by the appeals court in *Horne v. Flores*, was that “although test-score differences between ELL and non-ELL students were alarming, a lack of longitudinal data on students who had participated in language programs may have led to the underreporting of their success rates...” (Flores, Batalova, & Fix, 2012).

Students who speak English as a second language will continue to represent a growing number of the student-age population in the U.S. public school system. As this population continues to grow, so does the need to provide appropriate educational programs that will help ELL students achieve academic success. Controversy about the appropriateness and effectiveness of bilingual education continues to be a debate, leaving school administrators with limited answers and the responsibility of selecting and implementing programs for ELLs. Texas requires school districts to offer bilingual

education, and Dual Language is part of the “bilingual umbrella”. Two-Way Dual Language programs are one of several programs offered predominantly as a response to language minority learners. There is an existing body of research which suggests that Two-Way Dual Language programs offer the most effective means of developing successful language-minority learners (Baker, 2011; Cummins, 1981; Freeman et al., 2005; Thomas & Collier 2007). However, school districts are not required to offer Two-Way Dual Language programs. Many decisions about ELL education, however, are made locally. For this reason, a growing number of districts are looking for guidance as they encounter many new tasks and challenges in serving diverse student populations. The demographic changes of the K-12 student population present challenges in the classroom and require changes to both district and school current practices.

The purpose of this study was to determine if there is a difference in mathematics and reading achievement between students served in a Dual Language/Two-Way Immersion program and those who are served in a Transitional, Late-Exit Bilingual program by comparing students’ academic achievement in mathematics and reading as measure by the State of Texas Assessment of Academic Readiness (STAAR) standardized test.

- Is there a difference in mathematics achievement between English Language Learners served through a Dual Language Two-Way Immersion program and those served through a Transitional, Late-Exit Bilingual program?

Is there a difference in reading achievement between English Language Learners served through a Dual Language Two-Way Immersion program and those served through a Transitional, Late-Exit Bilingual program?

In this chapter a summary of the study will be presented. Followed by a discussion of the findings. Then the implications and recommendations for school leaders will be discussed. Finally, the recommendations for future research and summary will be presented.

Summary of the study

The data set was composed of ELL students who were enrolled in Kindergarten in the district of study during the 2006-2007 school year (Dual Language/Two-Way or Transitional, Late-Exit Bilingual program), and who continued to be enrolled in the district of study in the 2014-2015 school year. Students meeting the selection criteria were required to have been continuously enrolled in the district and served in the districts' bilingual program or dual language program. There were a total of two elementary campuses out of the 35 total elementary campuses in the district of study that met the selection criteria required for the study. There were a total of 116 ELL students enrolled in Kindergarten in both campuses during 2006-2007.

The student participants selected were served in either the Dual Language/Two-Way immersion program or the Transitional, Late-Exit Bilingual program but not both. The participants were students who met the following criteria:

- (a) were identified as ELL when they enrolled in Kinder during the 2006-2007 school year;
- (b) were enrolled in Kindergarten during the 2006-2007 school year and participated in a Dual Language/Two-Way Immersion or Transitional, Late-Exit Bilingual program;

- (c) had an oral language proficiency of Fluent Spanish Speakers (FSS) or Limited Spanish Speaker (LSS);
- (d) continued to be enrolled in the school district during the 2014-2015 school year, and
- (e) took the English version of the STAAR Reading and Mathematics test during the 2012, 2013, and 2014 administration.

Students not included in the study were students who:

- (a) were not identified as ELL when they enrolled in Kinder during the 2006-2007 school year;
- (b) were enrolled in Kindergarten during the 2006-2007 school year and did not participate in a Dual Language/Two-Way Immersion or a Transitional, Late-Exit Bilingual program;
- (c) had oral language proficiency of Non-Spanish Speaker (NSS);
- (d) were not enrolled in the school district during the 2014-2015 school year, and/or
- (e) took the Spanish version of the STAAR Reading and Mathematics test during the 2012, 2013, and 2014 administration.

The study used data from 24 students for the Dual Language/Two-Way Immersion program and 28 students for the Transitional, Late-Exit bilingual program from two campuses.

Discussion of the findings

In this causal comparative study three statistical analyses were conducted to provide insight to the research questions. A *t* test testing whether the difference in the

means is 0, the effect size was also used to determine the standardized difference between two means, and a Chi Square analysis was used to determine if there were significant differences between the two groups (Dual Language/Two-Way Immersion and Transitional, Late-Exit bilingual program) in terms of passing rates for the 2012, 2013, and 2014 Reading and Mathematics STAAR tests.

The data was analyzed and reported in two categories. The first analysis determined the student score averages in each cohort for reading and mathematics in 5th, 6th, and 7th grade STAAR first administration. Then, the score average and standard deviation were compared to determine if a statistically significant difference existed between the two groups' academic performance in STAAR reading and mathematics.

Research Question 1:

- What differences exist in mathematics achievement between English Language Learners served through a Dual Language Two-Way Immersion program and those served through a Transitional, Late-Exit Bilingual program?

In 5th and 6th grade Mathematics, there was not a significant difference between the Dual Language Two-Way Immersion student group and the Transitional, Late-Exit Bilingual group. However, there was a significant and small difference in the Bilingual group's higher academic performance than the Dual Language student group in the 8th grade Mathematics STAAR exam taken during their 7th grade year.

Research Question 2:

- What differences exist in reading achievement between English Language Learners served through a Dual Language Two-Way Immersion program and those served through a Transitional, Late-Exit Bilingual program?

In each of the three years, the Dual Language Two-Way Immersion student group outperformed the Transitional, Late-Exit Bilingual group in Reading. In summary, there was a connection between higher scores in Reading and the type of language program students participated in. There was a significant difference in how the two groups performed in Reading, which could be related to the type of language program instruction received. A possible explanation for two-way immersion students' improved reading skills is that two-way immersion education may foster more direct attention to language use. That is, two-way immersion students are more aware of their different languages, and they are encouraged to use both regularly (Marian, Shook, & Schroeder, 2013). However, in Mathematics, there was no evidence for a relationship between the type of language program the students participated in and their Mathematics academic performance. This finding is impressive given that students were tested in English even though students in both programs did not receive English instruction in Mathematics. Consequently, Spanish did not hinder the development of English for either group.

These findings support the hypothesis that dual language programs develop full bilingual and biliterate proficiencies in students (Collier & Thomas, 2004, 2009; Lindholm-Leary, 2007). Furthermore, considering that the assessments are conducted in English, the results also seem to support previous research regarding the benefits of second language acquisition during the early years of schooling (Green 1998; Krashen & Brown, 2005).

Implications and Recommendations for School Leaders

It is the responsibility of public schools serving ELL students to “meet the same challenging State academic content and student academic achievement standards as all

children are expected to meet” (NCLB, 2000). NCLB allows for local (district) flexibility for choosing programs of instruction, while demanding greater accountability for ELLs, English language, and academic progress (Cortez, Sorenson, & Coronado, 2012). An effective leader serves the critical role of spokesperson for the program with the school administration, school board, the parents, and the community. They also take responsibility for developing, planning, implementing, and evaluating the model at their campus. In this section the implications of the results for research and leadership will be presented. Different factors can shape decisions regarding the program design and the implementation process. The availability of bilingual faculty, bilingual materials, and funding plays an important role in the decision process. For this reason, it is important that the campus and district leadership leaders understand the program theory in order to be able to make appropriate instructional decisions when questions arise about program implementation and in order to guide parents and the community (Howard, Sugarman, Christian, Lindholm-Leary & Rogers, 2007)

The results of the present study should be interpreted with caution considering that the total population sampled is from one school district and should not be generalized for the entire population. Nevertheless, when comparing the performance of the students enrolled in the Dual Language Two-Way Immersion program and the Transitional Bilingual Late Exit program in Reading, it seems noteworthy that the results in Reading 2012, 2013, 2014 were higher for students in dual language. This seems to support previous research that indicates students enrolled in dual language can often demonstrate higher rates of academic performance than students enrolled in other bilingual programs (Thomas & Collier, 1997, 2002). In Texas, school districts are measured on how well

students perform across four areas: student academic achievement, student progress, closing performance gaps between low-achieving demographics, and post-secondary readiness (TEA, 2015).

Texas Education Agency (2015) reported an 88% graduation rate for the Class of 2014. ELL students have the lowest graduation rate of all subgroups at 71.5% statewide and only 8% of ELL students were considered college-ready in Mathematics and English, compared to 56% for all students. In Texas, a majority of ELL students are served in a bilingual program for a few years and are then transitioned to regular all-English instruction. However, ELL students are among the most likely to drop out, have only 1.5% passing all end-of-course exams, and 8% considered college ready. Finding the best model to educate ELL students in order to help a school's overall academic rating and to ensure their ability to be work or college ready is of most importance (IDRA, 2015).

In this study at all three years, 5th, 6th and 7th grade, the Dual Language Two-Way Immersion student group outperformed the Transitional, Late-Exit Bilingual group in Reading. The findings of this study add to the conclusion that it took at least five to seven years for ELLs to achieve academic norms (Cummins, 1981). It also contributes to Thomas and Collier's (2004) findings indicating that Dual Language students outperformed students in Transitional bilingual programs. However, in Mathematics, there was no evidence for a relationship between the type of language program the students participated in and their Mathematics academic performance. The research shows that simply adding more English instructional time does not yield higher achievement measured in English for ELLs; rather, the students who achieve at the highest levels in English are those who achieve at the highest levels in the home

language. Thus, research shows that providing a solid foundation in the home language yields higher achievement in English (Lindholm-Leary, 2007). In this study the students in the Dual Language Two-Way Immersion student group continued to receive Mathematics instruction in Spanish in 5th, 6th, and 7th grade and continued to reach acceptable scores when they took an English assessment. This supports that dual language programs develop full bilingual and biliterate proficiencies in our students (Lindholm-Leary, 2007). The analysis conducted by Collier & Thomas (2009) did not include the late-exit model. The results of this study contribute to the statement that the late-exit model has the potential to result in achievement closer to one-way dual language education (Collier & Thomas, 2009).

The literature supports the advantages of dual immersion approaches over developmental bilingual ones. The strongest of these models is dual immersion, which fosters bilingualism, strong academic achievement, and cross-cultural appreciation (de Jong, 2002; Mora, Wink, & Wink, 2001; Senesac, 2002). In this study students in both groups were linguistically diverse and at the time they were assessed in English. In reading in the critical middle school years 5th, 6th, and 7th grade, students in the dual language program outperformed students in a transitional bilingual model. Students and parents depend on the information schools provide them.

Greene (1998) stated that children limited English proficiency who are taught using their native language perform significantly better on standardized tests than similar children who are taught in English only. In overall academic achievement, ELLs are not doing as well as their non-ELL peers (Ryan, 2013). Krashen and Brown (2005) discovered that the faster students acquired language proficiency, the faster they

improved academically. For purposes of accountability, students need to be able to achieve in both languages. Educators need to understand that dual language research shows that students will achieve at grade level if the program is developed and implemented correctly (Lindholdm-Leary, 2007). The education of culturally and linguistically diverse students is dependent on the degree to which these children have access to instruction that is challenging and delivered in a way that is comprehensible. Limiting access to second language acquisition programs that are supported by research is also an area for improvement. If there's a program that allows linguistically diverse students an opportunity to achieve at higher academic levels then consideration for ways to increase or promote these programs should be given. They need an accepting school and social environment, which promotes academic achievement and values cultural and language diversity (Calderón & Carreón, 2000). The use of a student's native language in the instructional process is an important part of the teaching and learning environment (Verdugo & Flores, 2007).

Effective programs collect and use ongoing formative data on learning, teaching, attendance, behavior, and other important intermediate outcomes. There is also a strong focus on professional development for all staff members, including administrators. It allows standards of behavior and effective strategies for classroom and school management. The student population and attitudes within the school and the community are also key factors in successfully implementing a type of bilingual program in a school district and/or a school. The Texas school funding system is inequitable and fails to provide adequate funding for the education of ELLs and low-income students (Johnson, 2015). Some bilingual programs begin before materials in each language have been

purchased or have arrived, leaving literacy instruction in the minority language at a class-made, teacher-made level. The value of materials in each of the languages represented in oral instruction should be clear if we wish bilingualism for our children to include biliterate capabilities. The most important aspect of any program is teacher professional development in bilingual education. The success of the entire program can weigh heavily on the bilingual faculty (Montague, 1997).

The leadership of the campus is focused on building a “high-reliability organization” that shares information widely, monitors the quality of teaching and learning carefully, and holds all staff responsible for progress toward shared goals (Calderón et al., 2011). Educational leaders who are educated in the needs of ELLs create student-centered, learning environments focused on the academic achievement of all students (Gándara, 2000; Padron, Waxman & Huang, 2000; Valverde & Scribner, 2001; Zsembik & Llanes, 1996).

Limitations

There are a number of limitations considered in the analysis of the data. The study was limited to one school district. Although the district currently has six elementary campuses offering the Dual Language/Two-Way Immersion program, only two campuses met the selection criteria for this study. For the transitional, late-exit sample group and the dual language/two-way immersion sample group, only students meeting all of the selection criteria were included. In addition, only quantitative data was considered, and there are several qualitative factors that can possibly affect student academic performance on STAAR. The factors may include and are not limited to campus leadership style, program language implementation fidelity, parental involvement, staff development,

instructional resources, and student intervention efforts. The dual language program is dependent on the parents supporting and advocating for bilingualism and for the long-term commitment for children to complete all their school years in the program (Calderón & Carreón, 2000). The STAAR assessment is a standardized test and the scale score alone does not reflect the level of student success in its entirety. In addition, students in the districts transitional-bilingual late exit program are placed in the program according to TEC guidelines (Appendix C). The students in the dual language program had to meet entrance criteria before being accepted into the program (Appendix D).

Recommendations for future research

The purpose of this study was to determine if there was a difference in mathematics and reading achievement between students served in a Dual Language/Two-Way Immersion program and those who are served in a Transitional, Late-Exit Bilingual program by comparing students' academic achievement in mathematics and reading as measured by the State of Texas Assessment of Academic Readiness (STAAR) standardized test. Specifically, this study compared the 2012, 2013, and 2014 English reading and mathematics STAAR data of a cohort of students that participated in a Dual Language/Two-Way immersion and a cohort of students that participated in the Transitional, Late-Exit Bilingual program. The data obtained and analyzed was for the purpose of this study and additional studies on the same topic would continue to assist state and district leaders in making decisions about effective bilingual program selection. The following are specific recommendations for future research:

- 1) Educational researchers should further the research with a larger sample size from several districts in different locations to support generalizing the results.

- 2) Include surveys of student and teacher experiences in the transitional bilingual and dual language models.
- 3) Educational researchers should compare the academic achievement of the non-ELL students being served through a dual language program and the academic achievement of non-ELL students served in English only.
- 4) Educational researchers should compare the cost of dual language program model and transitional bilingual program models and the overall student academic achievement effect.

Conclusion

It is important for district and school leaders and educators to be aware of obstacles that can affect student learning and the impact it can have on their overall school rating. They also need to be aware of solutions that work. Schools and educators should also understand the patterns of the growing number of ELLs in their states, the languages represented, federal and state policies, and special state/regional factors that affect ELL learning, retention and achievement. Lindholm-Leary (2005) stated the demographics in the United States and the job market are changing, and these are the reasons it is important to help students become bilingual. Students who are bilingual will have skills that give them the capability to take advantage of more career opportunities.

As educational leaders of today and tomorrow, it is necessary to have an understanding of how diverse groups have succeeded, or failed, in getting attention for their language needs. Likewise, such leaders must also understand why and how opponents have been able to discredit the benefits of quality bilingual education pedagogy in various periods (Ovando, 2003). Both the bilingual and dual immersion

language program models provided in this district of study promote using the students' L1 to acquire academic success as English is acquired. The two major differences between these models are the length of time before the student is transitioned and the percentage of time English is spoken in the classroom, and in this district both programs served ELL students in their native language for at least six years. As with any major education decisions, school leaders should work in close collaboration with all stakeholders affected in order to determine which bilingual education model best meets school accountability, student, parent and the community's needs.

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Appendix A

Bilingual Continuum

Grade	Instruction			
	English/ELPS		Spanish	
Pre-K	10%	BICS	90%	All content areas
Kinder	20%	BICS Oral Language Development Calendar, Read aloud, Integrate Science vocabulary Specials	80%	All content areas; Language Arts Math Science Social Studies
1st	30%	Science (Scaffold) Integrate Social Studies vocabulary Specials	70%	Language Arts Math
2nd	40%	Science (Scaffold) Social Studies (Scaffold) English Phonics (Begin 2nd semester) Specials	60%	Language Arts Math
3rd	60%	Science Social Studies Spelling/Eng. Phonics Specials	40%	Language Arts Math
4th	80%	All Content Areas	20%	Content Support
5th/6th	90%	All Content Areas	10%	Content Support

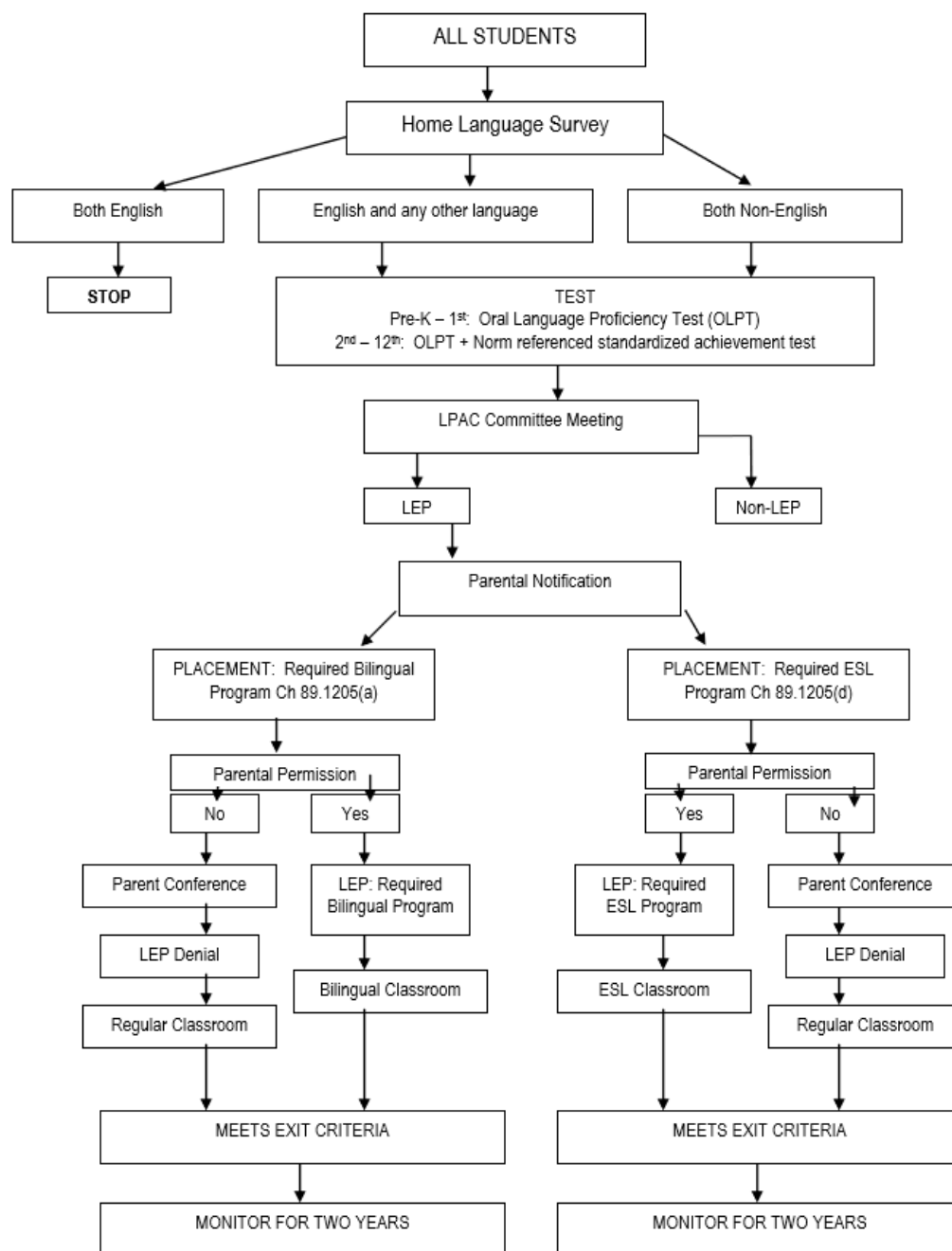
Appendix B

Dual Language Program: Language Distribution by Grade and Subject

Kinder	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
English LA	English LA	English LA	English LA	English LA	English LA	English LA Pre-AP	English LA Pre-AP	English LA or Pre-AP	English I or Pre-AP	English II Pre-AP	English III AP	English IV AP
Science	Science	Science	Science	Science	Science	Science	Science Pre-AP	Science Pre-AP	Reg or Pre-AP Biology	Reg or Pre-AP Chemistry	Advance d Science	Advanced Science
Math	Math	Math	Math	Math	Math	Math Pre-AP Or Math 6	Math Pre-AP Or Math 7	Pre-AP Algebra I Or Math 8	Pre-AP Geometry Or Algebra I	Pre-AP Algebra 2 Or Geometry	Advance d Math	Advanced Math
Social Studies	Social Studies	Social Studies	Social Studies	Social Studies	Social Studies	Social Studies	Texas History	US History	World Geography , World History or combined course	World Geography , World History, or combined course	Reg or AP US History	Reg or AP Government and Economics (or Dual Credit in Eng)
Spanish LA	Spanish LA	Spanish LA	Spanish LA	Spanish LA	Spanish LA	Spanish I	Spanish IIA	Spanish IIB	PAP Spanish III	PAP Spanish IV	AP Spanish Languag e	AP Spanish Literature or Discovering Lang/Cultur es
PE/Music	PE/Music	PE/Music	PE/Music	PE/Music	PE/Fine Arts	PE/Fine Arts	PE/Athleti cs/Fine Arts	Athletics / Fine Arts	Athletics/ Fine Arts	Athletics/ Fine Arts	Dual Credit courses	Dual Credit courses

Appendix C

Limited English Proficient Decision Chart



Appendix D

Campus Guidelines for Dual Language Enrollment

The ideal composition of the classroom should be 1/3 fluent monolingual English speakers, 1/3 fluent monolingual Spanish speakers and 1/3 students with proficiency in both languages.*

- For students beginning in a Dual Language program in Kindergarten, campuses will ensure that students have been enrolled based on the established criteria for English and/or Spanish proficiency.
 - ✓ FES **or** FSS on the OLPT
 - or
 - ✓ LES **and** LSS on the OLPT
- Students being considered for entry into the program in First **or** Second grade must meet the following criteria:
 - ✓ FSS or FES on the OLPT or Advanced (A) on TELPAS for ELL students
 - ✓ Teacher recommendations
 - ✓ A score of Developed on TPRI or Tejas Lee
 - ✓ Parent Commitment
- Students being considered for entry into the program **after** Second grade must meet the following criteria:
 - ✓ FSS **and** FES on the IPT or Advanced High (H) on TELPAS for ELL students
 - ✓ 60% or above on a Spanish Achievement test in reading, writing and math sections (to be administered by the campus)
 - ✓ Passing English STAAR scores
 - ✓ Teacher recommendation
 - ✓ Parent Commitment
 - ✓ Report Card grades
- Secondary schools:
 - ✓ Passing scores on a Spanish I and/or II Credit by Exam (CBE) depending on the grade level the student is entering
 - ✓ Passing STAAR scores (if available)
 - ✓ Report card grades
 - ✓ Teacher recommendation
 - ✓ Parent commitment
- Recent Immigrant students can be considered for the program if:
 - ✓ It is determined that they have a solid academic foundation as demonstrated by transcripts brought to the campus or obtained by the Bilingual department showing previous schooling, plus some proficiency in English
- New enrollees to _____ school district from other Dual Language programs in the U.S. can also be placed in the Dual Language Program once records have been verified and the qualification criteria is met
- It is important to note that Dual Language implements an accelerated and rigorous curriculum. Therefore, for any deviation from the guidelines for enrollment.