STUDENT ACHIEVEMENT FOR ENGLISH LANGUAGE LEARNERS AND NON-ENGLISH LANGUAGE LEARNERS: DUAL LANGUAGE, TRADITIONAL BILINGUAL, AND ALL ENGLISH PROGRAMS

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Abstract

There is an ethical calling for educators and researchers to investigate more effective programs to benefit underperforming English language learners (ELLs) in schools today. The purpose of the current study was to investigate the implementation of a two-way dual language program in a large urban North Texas school district, as measured by the State of Texas Assessment of Academic Readiness (STAAR). The study was causal comparative and considered *ex post facto* with data that included fifth grade math and reading STAAR scale scores from 2012, 2013, and 2014. After inclusion criteria were confirmed, 478 student scores were included in the study for reading and 487 scores for math. Test results were presented from the one-way analysis of variance (ANOVA) comparing the achievement of ELLs in dual language, non-ELLs in dual language, and students at the dual language campuses that received instruction in English. One-sample t-tests were also conducted to make comparisons with district means for ELLs and non-ELLs. The overall results of the current study show that non-ELLs (English dominant) in dual language achieved higher mean scale scores than ELLs in dual language, and students who received their instruction in English, and in most cases there was a significant difference. The data also show that non-ELLs in dual language achieved a significantly higher scale score in reading and math as compared to non-ELLs in the district for two of the three years examined.

Keywords: two-way immersion, 50:50 two-way dual language, bilingual education, English language learner, non-English language learner, English dominant

Dedication

When one finds what they love and have the opportunity to pursue it, one will do things that they never imagined, and God will bless them beyond belief. I am so grateful to my sweet husband (Greg) and two boys (Alex and Micah) for giving me the chance to fulfill the dream of a life time, and the opportunity to continue my passion for learning at this level. Without you, all of this means nothing!

I am fortunate to say that every step of this journey has been a blessing and God's plan was revealed along the way through people, circumstances, and friendships. From the very beginning, I knew that God had brought together our cohort for His perfect timing. I have been blessed beyond measure by our tight knit group of 19 students, and particularly our group of ladies who have bonded together over many prayers for the last four years. I know that I would not have made it without the support, encouragement, and love of this group of servant leaders.

I have also been fortunate to have friends along the way that have to be tired of hearing about my classes, research, homework, dual language, and editing my work. Julie, you inspired me to start this journey, Margaret kept me organized with everything that I had to do at work, school, and home, and Renee was always around late at night and on the weekends to encourage me! I am also grateful to my parents for encouraging me to finish what I start, and to not put off to tomorrow what you can accomplish today. I am also thankful for my sister Sheryl whose encouragement in the last year helped me make it through! I am living proof that it is never too late to be inspired to learn something new and that the journey is just as rewarding as the destination. In my case, I am truly grateful for both!

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Finally, Cohort I was truly blessed when Dr. Lee joined us as our professor in the spring of 2014. What kind of professor tells you to bring your blanket and pillow to class anyway? The kind of professor who brought us encouragement, hope, clarity, and wisdom at a turning point in our program. I am most grateful to Dr. Lee and I believe that God put you in my path at just the right time. I cannot thank you enough for the servant that you have been to me and for the prayers that you have offered on my behalf. It has been my honor to learn from you!

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CHAPTER 1. INTRODUCTION

Introduction to the Problem

There has been much debate regarding the best way to serve English language learners (ELLs) in the education system. Many programs have been developed, with some providing greater cognitive results for the students (Thomas & Collier, 2012). One program that has become more popular over the years, as political pressure has increased to better serve students, is the dual language immersion program, also known as two-way immersion (TWI). The increasingly acceptable use of this model comes from the embedded structure that brings together native Spanish speakers and native English speakers with the goal of the program to produce bilingual and bi-literate students.

As the student population of ELLs increases in size so does the challenge to find worthwhile programs to serve the students more effectively. Equally important is the success of all children. Many benefits are gained when the goal is to educate students in two languages and fully develop their language skills in listening, speaking, reading, and writing. Noted researchers in the field of bilingual education, Dr. Wayne Thomas and Dr. Virginia Collier, as well as other notable researchers, have documented additional benefits like expanded thinking skills that come from the curriculum being taught through the use of two languages, and a respect that comes from working with diverse peers in a dual language setting. Benefits were not only measured cognitively in English, but students participating in dual language programs demonstrated academic performance at

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or above grade level in Spanish (Lindholm-Leary & Block, 2010; Thomas & Collier, 2012).

Background of the Study

The desire to complete this study was derived from the observed benefits to students who participate in two-way dual language program in a large urban North Texas school district as well as the supporting research that is available in the field of bilingual education. Currently, there is no formal compilation of data in the district to document the achievement benefits to ELLs or non-ELLs who participate in dual language, or comparisons made against other bilingual and monolingual programs in the North Texas school district. In an effort to make instructional decisions based on measurable outcomes, the metrics were examined and disaggregated to have a full understanding of the impact of this established program. In addition, to determine the full impact of the dual language program (positive or negative), it was important to make comparisons with other programs that have been implemented in the district for ELLs and non-ELLs.

Statement of the Problem

Education is a gift freely given via the Federal Government and Texas State Constitution. Children have the right to attend school and receive a free education because of the historical decisions of these governing bodies. In Texas, students whose primary language is something other than English also have additional rights found in the Texas Education Code. If they are assessed and found to have limited English, it is the law that they must be provided the opportunity to participate in a bilingual or English as a Second Language (ESL) program. The goals of these two programs are to develop the students listening, speaking, reading, and writing in English (Texas Education Code,

www.manaraa.com

2012). However, not all children who attend school and participate in bilingual and ESL programs develop their language and academic skills at the same level of achievement as their peers of other ethnicities enrolled in monolingual programs.

In Texas, and the local school district that is a part of this research, ELLs are underperforming when compared to their white monolingual peers. Evidence to support this statement was presented in the Texas Academic Performance Report (TAPR), which reported in 2012-13 that 89 percent of all white students met the phase-in standard in reading, but only 52 percent of ELLs met the minimal phase-in standard (Texas Education Agency, 2013f).

To add to the problem, ELLs were the lowest performing sub-group in reading. All other content areas tested in the state of Texas reflected similar disparities. Locally, the gap between ELLs was 30 percentage points lower than white students in reading, as measured by the State of Texas Assessment of Academic Readiness (Texas Education Agency, 2013e). Ethically, the large gap between the different sub-groups reflected a need to initiate local research that will drive future instructional decisions which promote higher learning outcomes for ELLs. To compound the problem, in more recent research, Lindholm-Leary and Hernandez (2011) reported that ELLs are at highest risk for dropping out of school.

The phase-in standards for the State of Texas Assessment of Academic Readiness (STAAR) were established to give educators the opportunity to prepare and adjust to the increased rigor of new STAAR assessment (Texas Education Agency, 2014b). For the purpose of the current study, the measure used to determine if a student met expectation was Phase-In I, which was the baseline minimal standard established by the Texas

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Education Agency. More detail regarding the phase-in standards will be discussed in Chapter 2.

Purpose of the Study

The purpose of this study was to compare the reading and math academic achievement of the three groups of fifth grade students enrolled at the dual language campuses who included ELL and non-ELL students enrolled in dual language, as well as the students who received their instruction in all English (monolingual). The comparison of the three groups for each testing year (3 years of data) as measured by STAAR provided quantitative data regarding the achievement of students at the two local campuses based on the designated group.

The secondary purpose of the study was to compare achievement of fifth grade ELL students enrolled in dual language with the district mean of ELL students of the same grade who were enrolled in another district bilingual program as measured by the reading and math STAAR test.

Finally, comparisons were made between the district means (STAAR reading and math) of fifth grade monolingual students (non-ELL) with non-ELL students who participated in dual language. Figure 1 shows the comparisons between groups at the dual language campuses (highlighted in gray) and comparisons of the district means (in white).

The study disaggregated the data in a manner that shed light on the achievement of ELLs and non-ELLs participating in dual language as compared to students on the same two campuses who were enrolled in monolingual programs (all English instruction).

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The state testing data in reading and math were collected for the following assessment years: 2011-12, 2012-13, 2013-14.
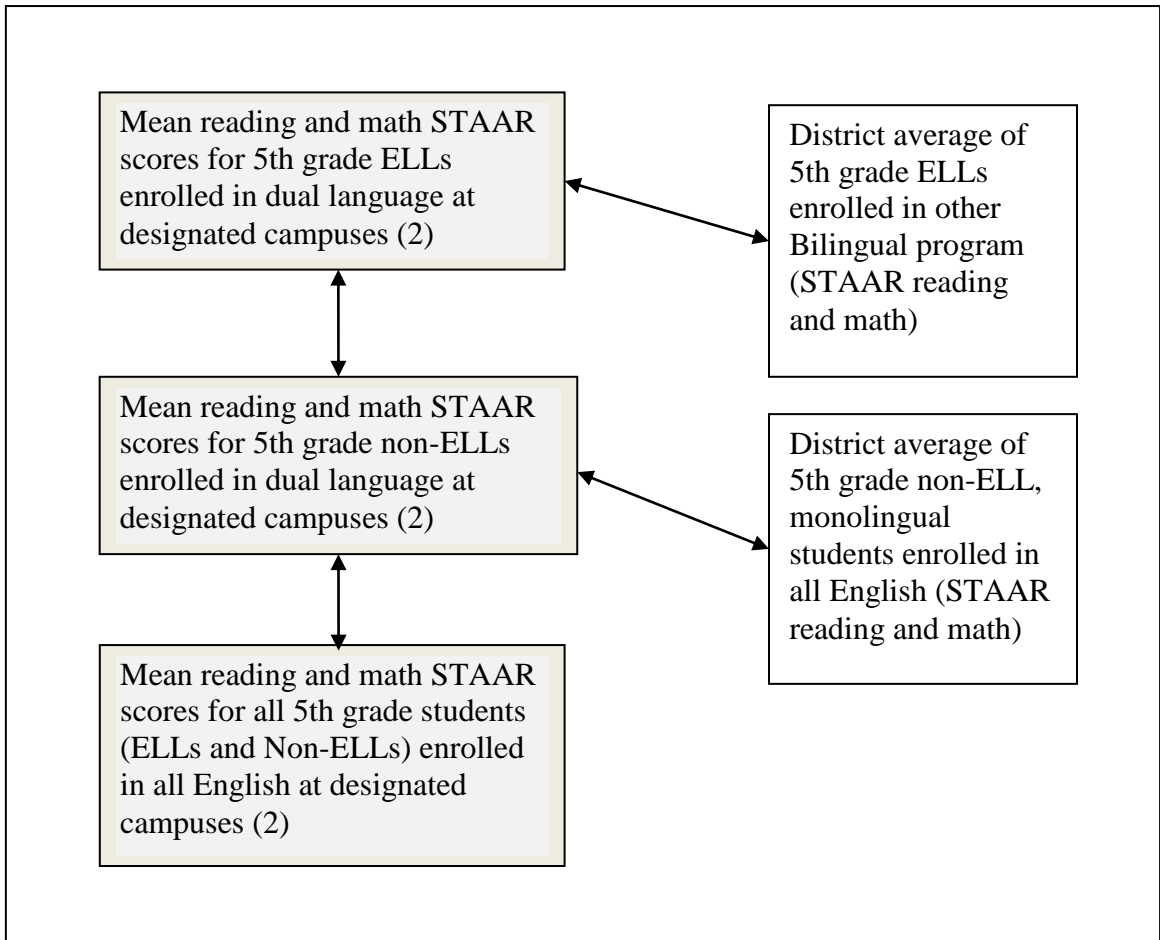
Figure 1. Visual representing the defined groups of data collected and the comparisons made between campus groups and district averages.

The overall objective was to determine if the students who participated in the large urban North Texas school district's dual language program (which was isolated to two campuses) were more successful than students in the monolingual classrooms or students enrolled in other bilingual programs within the district.

Collier and Thomas (2004,) as well as other noted researchers, were recognized for their research in regard to the benefits of dual language education and have presented

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longitudinal data that supported the premise that two-way dual language programs effectively close the academic gap of native Spanish speakers in comparison with their English speaking peers (Collier & Thomas, 2004; Lindholm-Leary, 2001; Lindholm-Leary & Block, 2010; Lindholm-Leary & Hernandez, 2011; Thomas & Collier, 2002). Other research presented similar findings as to the benefits of dual language for ELLs and is presented in the literature review of this study (Chapter 2). However, there was little research that quantifies the potential academic benefits for the non-ELLs participating in the program and no formal research pertaining to the effectiveness of the program in the local school district.

Rationale

The prime rationale for the current research study was that ELLs were underperforming when compared to their monolingual language majority peers. Currently the commonly used bilingual programs have not been successful at closing the achievement gap for this growing population of students.

The National Center for Education Statistics (2012) reported that in 2010-2011, Texas served 708,615 ELLs who were participating in language programs in public schools, which accounted for 15% of the student population. Furthermore, it was reported that the average scale score on the National Assessment of Educational Progress (NAEP) in fourth grade reading was 188 across the nation for students who were ELLs. For students who were not designated ELLs, the average score was 225, leaving a 36 point gap between the two groups (National Center for Education Statistics, 2012).

As students progressed in their schooling the gap only widened, as ELLs in eighth grade who took the NAEP in the same year scored an average of 224 and non-ELLs

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scored an average of 267, accounting for a 44 point gap (Center for Education Statistics, 2012). When examining the statistics at the local level, the north Texas school district's ELL population that is the focus us the current study was at 39.4% which was more than double the state average (Texas Education Agency, 2013). Under the current accountability system, STAAR is the required state mandated test used to measure student achievement and ELLs are the lowest performing sub-group (Texas Education Agency, 2013e).

There was additional evidence that ELLs were underperforming when compared to their monolingual counterparts. Lindholm-Leary and Block (2010) acknowledged the growing Hispanic population in the United States and the growing achievement gap. They also reported a 21% high school dropout rate and 11% college completion rate for Hispanics. In addition, the Hispanic population is growing in Texas and in the United States, placing the impetus on school leadership to find more effective programs and pedagogy to serve second language learners (Lindholm-Leary & Block, 2010).

There are many types of programs that have been developed with second language acquisition as the goal. Genesse, Lindholm-Leary, Saunders, and Christian (2005) examined decades of research starting in 1980 and concluded that ELLs were more successful when they participated in a program that was developed and implemented with their specific needs in mind. While there was a multitude of programs available to serve ELLs with some producing better results, any program is preferred over a setting that is all English with no support for their language needs. Mora, Wink, and Wink (2001) also examined programs ranging from those that provided English immersion only, transitional bilingual education that provides some instructional support

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in the native language, and bilingual two-way dual language immersion. Through their research they recognized that the goal of a dual language program was bilingualism and enrichment that, in turn, also produced higher academic gains for all students who participated.

With reported evidence that dual language programs were increasing learning outcomes for students, it was natural to ask questions and attempt to glean more information about the program and populations that are participating. As with any program, conflicting research is available that reports increased student achievement and some studies where measurable differences were not reported.

The synthesis of the data from this study can also provide valuable information to districts or campuses with similar demographics who desire to know the quantifiable academic benefits of the implementation of a two-way immersion dual language program. More specifically, the research was intended to provide quantifiable data for local leadership to make informed programming decisions that will translate into higher performance for all students in the district.

Research Questions

The current study addressed the following questions and intended to provide quantitative data to determine the effectiveness of the dual language program in serving ELLs and non-ELLs, as well as make comparisons with district averages.

Research Question 1 (RQ1)

Are students who participate in dual language (ELLs and/or non-ELLs) in a large North Texas school district more successful academically in reading and math than their peers who receive all instruction in English as measured by the STAAR test?

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H1$_0$: There will be no statistically significant difference in the mean of fifth grade reading STAAR scores of ELLs in Dual Language, non-ELLs in Dual Language and students receiving their instruction in all English.

H1: At least one of the population means for STAAR reading is different.

H2$_0$: There will be no statistically significant difference in the mean of fifth grade math STAAR scores of ELLs in Dual Language, non-ELLs in Dual Language and students receiving their instruction in all English

H2: At least one of the population means for STAAR math is different.

Research Question 2 (RQ2)

Are ELL students who participate in dual language more successful in reading and math than ELL students who participate in other bilingual models in a large North Texas school district as measured by the STAAR test?

H3$_0$: There is no statistically significant difference in the mean of fifth grade reading STAAR scores of ELLs in Dual Language and ELLs who participate in other bilingual models in the district.

H3: There is a statistically significant difference in the mean of fifth grade reading STAAR scores of ELLs in Dual Language and ELLs who participate in other bilingual models in the district.

H4$_0$: There is no statistically significant difference in the mean of fifth grade math STAAR scores of ELLs in Dual Language and ELLs who participate in other bilingual models in the district.

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H4: There is a statistically significant difference in the mean of fifth grade math STAAR scores of ELLs in Dual Language and ELLs who participate in other bilingual models in the district.

Research Question 3 (RQ3)

Are non-ELL students (language majority) who participate in dual language in a large North Texas school district more successful in reading and math than non-ELL students in the district who receive all instruction in English as measured by the STAAR test?

$H5_0$: There is no statistically significant difference in the mean of fifth grade reading STAAR scores of non-ELLs in Dual Language and non-ELLs in the district.

H5: There is a statistically significant difference in the mean of fifth grade reading STAAR scores of non-ELLs in Dual Language and non-ELLs in the district.

$H6_0$: There is no statistically significant difference in the mean of fifth grade math STAAR scores of non-ELLs in Dual Language and non-ELLs in the district.

H6: There is a statistically significant difference in the mean of fifth math STAAR scores of non-ELLs in Dual Language and non-ELLs in the district.

<center>**Significance of the Study**</center>

The intent of the current study was to evaluate the effectiveness of the local dual language program to provide a body of knowledge that was specific to the students of the local district and the implementation of the program. In addition, the dual language data was compared to resulting data from students participating in the monolingual program on the two campuses. Comparisons were also made to district averages for bilingual and monolingual programs. Due to the nature of the study it was defined by Anderson, Herr, and Nihlen (2007) as action research; "In the field of education, the term action research

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connotes 'insider' research done by practitioners using their own site (classroom, institution, school district, community) as the focus of their study" (p. 2).

The resulting data of the action research study, in conjunction with other available research, will assist district and campus leadership in future programming decisions and will provide essential information to the dual language campuses who have achieved full implementation of the program, and those who are at midpoint in their implementation.

Second, the study examined three years of STAAR data for fifth graders at the dual language campuses, resulting in a unique collection of data that could serve to guide future instructional decisions as the phase-in standards increase in the coming years. Even though the current study is considered action research, the reported results can complement the existing body of knowledge regarding bilingual education and dual language programs. It can also serve as a resource for educators from districts and campuses with similar demographics who seek to understand and acquire knowledge about dual language programs and the potential benefits for ELLs and non-ELL students. For the current study, the majority of second language learners participating in the dual language program have identified Spanish as their heritage language.

Definition of Terms

The definition of terms provided in this section is meant to offer clarification and a frame of reference for the reader in regard to specific terminology that is used in the research study.

Additive Bilingual Education

A program that provides enrichment or additive models that respect and cultivate the language minority student's first and second language (Ray, 2009).

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At-Risk Student

"An 'at-risk' student is generally defined as a student who is likely to fail at school" (Kaufman, Bradbury, & Owings, 1992, p. 2), or a student who is defined by state criteria who has the potential of dropping out of school (Texas Education Agency, 2012c).

Bilingual

The term refers to a student who is participating in a state-approved bilingual education program (Texas Education Agency, 2012c).

Bilingual Education

A description of an education program in an English-language school system in which students with little fluency in English are taught in both their native language and English (Merriam-Webster, 2014).

English Language Learner (ELL)

A student is classified as an English language learner when a language other than English is used as the primary language in the home and the student's English language proficiency is determined to be limited by a Language Proficiency Assessment Committee (LPAC) or as indicated by a test of English proficiency (Texas Education Agency, 2012c).

English as a Second Language (ESL)

A description of a student who is participating in a state-approved English as a second language (ESL) program (Texas Education Agency, 2012c).

First Language (L1)

The term refers to the first language learned or heritage language.

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Limited English Proficient (LEP)

The phrase refers to a student identified as LEP by the Language Proficiency

Assessment Committee (LPAC) according to criteria established in the Texas

Administrative Code (Texas Education Agency, 2012c).

Majority Language

The expression refers to the primary language spoken by the people of a region or

country and also known as the heritage language. For example, Japanese is the majority

language in the country of Japan.

Minority Language

The term refers to the language other than the one spoken by the people of a

region or country. For example, Spanish is a minority language in the United States.

Monolingual

Refers to a person who only speaks one language. For the purpose of this study,

the language is English.

Non-English Language Learner (non-ELL)

A non-ELL is a person who is not classified as an English language learner (ELL)

because they have attained proficiency in English.

Second Language (L2)

The term refers to the second language acquired.

State of Texas Assessment of Academic Readiness (STAAR)

The State of Texas Assessments of Academic Readiness replaced the Texas

Assessment of Knowledge and Skills (TAKS) beginning in spring 2012. The STAAR

program at grades 3–8 assesses the same grades and subjects as was assessed on TAKS (Texas Education Agency, 2012).

Subtractive Bilingual Education

Refers to a bilingual program that is meant to eradicate the students' first language and replace it with English (Ray, 2009).

Transitional Bilingual Program

A bilingual program that serves students identified as limited English proficient (LEP). The academic content is initially taught in the student's first language and English, and eventually transitions to the majority of instruction in English. Students remain in the program for an average of 2-5 years before exiting (Texas Education Agency, 2012c).

Two-Way Dual Language Program

The term refers to programs that have the demographics to invite native-English-speaking students (monolingual) to join their bilingual and ELL peers in an integrated bilingual classroom (Thomas & Collier, 2002).

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Assumptions and Limitations

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Assumptions

The entire study hinged on the implementation of the two-way dual language model, specifically with 50 percent of all content taught in English and 50 percent of all content taught in Spanish. The study assumed that all teachers implemented the model with fidelity in all classrooms throughout both schools identified for research.

 The study assumed the general rule that students who were non-ELL were only permitted admittance to the program in kindergarten or first grade. After first grade, the

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only students enrolled in the dual language program were students who qualified for bilingual services or could demonstrate an academic language foundation by means of a district administered language assessment.

The data used for the study was a result of fifth grade STAAR math and reading tests from 2012, 2013, and 2014. It was assumed that all tests were administered using the Texas Education Agency (TEA) guidelines found in the test administrator manual and that the testing environments for all students were conducive for students to demonstrate their academic knowledge in the content areas.

It was assumed that the passing criteria used for this study was aligned with the initial Phase-in 1, Level II for math and reading STAAR. Level II indicates that the student achieved satisfactory academic performance based on the established standards for the year. Table 1 displays the information provided by the Texas Education Agency and the established cut scores for Phase-in 1, Level II (Texas Education Agency, 2013). TEA provided guidance on the standards that is reflected in the quote below:

> STAAR performance standards relate levels of test performance to the expectations defined in the state-mandated curriculum standards known as the Texas Essential Knowledge and Skills (TEKS). Cut scores established by the agency distinguish between performance levels, or categories. The process of establishing cut scores that define performance levels for an assessment is standard setting. Standard setting is also used to classify students into an appropriate performance category. (Texas Education Agency, 2014, para. 1)

Table 1

Cut Scores for Grade 5 STAAR, Phase-in 1, Level II

Assessment	Phase-in 1, Level II	Language
STAAR Grade 5 - Reading	1458	English
STAAR Grade 5 - Math	1489	English

It was also assumed that the STAAR test is a valid and reliable instrument as reported by the Texas Education Agency (TEA), and that the results accurately measured students acquisition of the Texas Essential Knowledge and Skills (TEKS) (Texas Education Agency, 2013). Validity refers to the degree to which the assessment measures what it was created to measure. If the design is valid, the measurement tool or experimental design will yield the results that tell the researcher what they want to know about their subject (Vogt, 2007).

In the Texas Education Agency (TEA) Standard Technical Process Manual, it was noted that some methods for measuring reliability required multiple administrations to the same subjects. However, for STAAR, estimation methods of reliability were developed and used that required only one administration (Texas Education Agency, 2013a).

Limitations

Based on the nature of the study (action research), the findings will be limited in the generalization to other settings. Furthermore, the current study is limited due to the mobility rate of the two dual language campuses. The most recent data retrieved from the Texas Academic Performance Reports (TAPR) reflected that the campuses that were

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studied had 20.9 percent and 16.2 percent mobility rate for the 2011-12 school year (Texas Education Agency, 2013).

For the function of clarification, the two-way dual language program that was implemented at the two campuses was isolated to the use of English and Spanish and was a 50:50 two-way program with all content taught in both languages. The model structure does not require the use of English and Spanish, the only requirement is the use of the majority language where the program is being implemented. The second language could be French, Mandarin, or any other language that can be supported by the teaching staff. The parameters of this model also require that 50% of the participants were native Spanish speakers and 50% native English speakers. Attempts were made by both campuses to ensure a balance of participants in each dual language classroom; however, the mobility rate of the district presented a limitation for the study leaving some classes with more ELLs then language majority students.

For the purpose of the current study students who were qualified and receiving services in special education and gifted and talented (GT) programs were included in the sample based on the sub groups where they qualified. For example, there are GT students who participated in dual language and GT students who are enrolled in the all English program.

Students who tested in Spanish were not included in the study since the scale scores for Spanish reading were not aligned with English. While this was a limitation, there are few students who tested in Spanish by the time they reached fifth grade, particularly if they had been in the dual language program from grades kindergarten or first. Furthermore, students who were newcomers to the country who might have tested

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in Spanish would have been disqualified from the sample since they had not been enrolled in the program for the required period of time.

The biggest limitation for the current study was the size of the ELL student group. Students who are identified as LEP are coded at the state level as ELL in the Public Education Information Management System (PEIMS). Based on this qualification, student progress is monitored through a campus-based Language Proficiency Assessment Committee (LPAC) with the primary goal of English fluency. Students' English acquisition is measured each year and services are provided through a bilingual program or English as a second language program. Students exit the programs and are reclassified when specific criteria are met that include passing state assessments and achieving at pre-determined levels in English for listening, speaking, reading and writing. Many students exit ELL status and are reclassified by the third or fourth grade, based on their progress. Therefore, by fifth grade there is a smaller group of students who remain coded as ELL. Even with the combined student group from the two campuses, the ELL group ranged in size from 20–38 students for each testing year.

<div align="center">**Nature of the Study**</div>

The action research quantitative study is considered causal-comparative, non-experimental design used to determine cause and effect as defined by McMillan (2012). The study was also classified as *ex post facto* due to intentional design. "In ex post facto research the investigators decide whether one or more different preexisting conditions have caused subsequent differences when subjects who experienced one type of condition (the phrase ex post facto means 'after the fact')" (McMillan, 2012, p. 194). The general

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nature of the study presented an obvious limitation since the researcher had no control over the variables (McMillan, 2012).

Organization of the Remainder of the Study

The remainder of the study is organized and structured as follows. Chapter 2 is the literature review that includes current research of effective programs to serve bilingual students. It also includes a detailed description of the different types of dual language programs and available data reflecting the effectiveness of dual language programs for ELLs and non-ELLs. Chapter 2 concludes with a synopsis of suggestions for additional research that were addressed in the current study.

Chapter 3 details the research design and methodology where the population and sample are identified, with specifics about the setting, instrumentation, and measures. The chapter also includes detailed information regarding procedures for the study, data collection, validity, reliability, data analysis, and ethical considerations that pertain specifically to this study.

Chapter 4 reports the data that resulted from the statistical tests performed.

Chapter 5 provides a summary of the study, interpretation of the results, and potential generalizations. Limitations and implications of the study are also included along with recommendations for further study.

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CHAPTER 2. LITERATURE REVIEW

Historical Background

There is historical and current data that reports that students who are identified as English language learners (ELLs) or limited English proficient (LEP) are underperforming in the United States and in Texas schools (Collier & Thomas, 2004; Lindholm-Leary & Block, 2010; National Center for Statistics, 2012; Texas Education Agency, 2013e). More specifically, they are underperforming when compared to students who are designated as white. With the increase in immigration to the United States comes the increase in the numbers of ELLs in schools today and the challenge to provide programs that meet the needs of this specific student group (Honigsfeld, 2009).

In the state of Texas, there is policy contained in the Texas Administrative Code (TEC), Chapter 89, Subchapter BB which sets forth the rules for educating ELLs. The TEC states:

It is the policy of the state that every student in the state who has a home language other than English and who is identified as an English language learner shall be provided a full opportunity to participate in a bilingual education or English as a second language (ESL) program, as required in the Texas Education Code (TEC) (Texas Education Agency, 2012b, para. 1).

The goal of bilingual education and ESL programs is to support students in the acquisition of English in the areas of listening, speaking, reading, and writing. Bilingual

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programs integrate the use of the student's native language as a foundation for learning English. ESL programs use specific strategies and instructional techniques to support student's acquisition of English (Texas Education Agency, 2012b).

The TEC also requires districts to address the effective, linguistic, and cognitive needs of ELLs through the use of bilingual and ESL programs. The primary difference between the two is that the native language is used in bilingual programs to build skills and concepts whereas, with ESL programs, the specific instructional techniques are used to support the learner in their second language acquisition (Texas Education Agency, 2012b).

Texas has been impacted by the number of ELLs in public schools and with the changes in the accountability system in Texas and the commencement of a new testing instrument (State of Texas Assessment of Academic Readiness), the performance for ELLs has remained much the same, lagging behind their white peers. For example, the Texas Academic Performance Report (TAPR) noted in 2012-13, that 89% of all white students met standard for reading, with only 52% of ELLs meeting the same standard (Texas Education Agency, 2013f). In mathematics, the gap closed slightly with 88% of white students and 62% of ELLs meeting the state standard for the year, which is still a 26% difference between the sub-groups (Texas Education Agency, 2013f).

In the local school district where the current study took place, the problem is similar with students identified as ELL underperforming as measured by the State of Texas Assessment of Academic Readiness (STAAR). This is reflected in the most recent district data as well, with 50% of ELLs as compared to 80% of white students meeting the state standard in reading. The district passing rates for mathematics is similar to the

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state in that 76% of white students met the standard as opposed to only 56% of ELLs who met the standard (Texas Education Agency, 2013e). As educators reflect on the reported statistics, there is an urgency to evaluate programming and find more effective ways to reach the ELL population. "Improved education is key to improving ELLs performance on these tests and narrowing the achievement gap. Research results can and should inform such improvements" (Genesee et al., 2005, p. 364).

The primary difference between the state required programs (bilingual and ESL) and two-way dual language are the differing goals. As stated before, the goal of bilingual and ESL programs, in Texas is proficiency in English. The goal of two-way dual language programs are proficiency in English and another language. For the current study, the dual language program was piloted and has continued in the use of English and Spanish. The use of the program was meant to meet the needs of underperforming ELLs at the two campuses and integrate language majority students into the program so that ELLs and non-ELLs were learning two languages side by side.

The urgency to provide support for underperforming students dates back many years in the history of our country. No Child Left Behind (NCLB) forced states and local school districts to address this on-going problem; however, the premise of NCLB dates back to 1965 in the wake of President Lyndon B. Johnson taking office and committing the federal government and the American people to making a difference in the lives of children of poverty (U.S. Department of Education, 2002). On April 9, 1965 the Elementary and Secondary Education Act (ESEA) was passed and was notably the most expansive education legislation ever passed (The Social Welfare History Project, 2013).

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In 1968, the law was amended to provide Title VII funding for students who were underperforming due to language barriers. With that, the Bilingual Education Act was passed and specifically offered support for students who were limited English proficient (LEP) (The Social Welfare History Project, 2013). The new legislation brought a focused emphasis on students who were limited in their English proficiency and the responsibility given to the states of how to provide services that would achieve the desired outcomes.

For historical reference, it is important to briefly examine the impact of the Supreme Court ruling in *Lau v. Nichols*. The case was filed by a group of Chinese-American students living in California. The foundation of the case hinged on students not receiving support in school because they did not speak English, which was considered discrimination based on their ethnicity. The Supreme Court ruled in favor of the students with the following statement from Justice William O. Douglas: "There is no equality of treatment merely by providing students with the same facilities, textbooks, teachers and curriculum; for students who do not understand English are effectively foreclosed from any meaningful education" (U.S. Legal, 2010, p. 1).

Since the intention of the current study is to benefit the local district, the focus of the current research is to understand the implications and impact of the existing two-way dual language program, and its effectiveness for students as compared to other programs offered in the district. The two-way dual language program was originally piloted to allow participating ELLs and non-ELLs to fully develop their listening, speaking, reading, and writing communication skills in English and Spanish. It was expected that they would outperform their peers based on historical research data that is presented in

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the pages to follow. The two-way dual language immersion program implemented in the local school district was constructed and aligned with the core characteristics of immersion education put forth by the Center for Advanced Research on Language Acquisition (CARLA). The defining characteristics of the program are referenced below.

1. The curriculum and instruction is delivered through the majority and minority language to promoted dual language proficiency.

2. In elementary schools instruction in all subjects occurs in the minority language for at least 50% of the day.

3. Teachers are proficient and fluent in the language in which they teach.

4. There is strong community support for the majority language (English).

5. There is a clear separation of languages throughout the school day (Center for Advanced Research on Language Acquisition, 2014).

The organization and structure of the remaining sections of this chapter will include a justification for the research, an explanation of the different types of programs that are available for ELL students and the programs that are inclusive of non-ELLs. The literature will be presented regarding the achievement of ELLs in two-way dual language programs as well as the achievement of the language majority students. The conclusion of the chapter will specifically outline and examine the need for additional research in regard to dual language programs and their effectiveness and achievement of English language learners.

<div align="center">

Justification of Research

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Research data indicates over and over again that ELLs are underperforming in the United States, Texas, and the local school district. The National Center for Education

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Statistics just released scores from the 2013 National Assessment of Educational

Programs in reading and math. Nationally, in reading, 68% of fourth graders in the

sample were at or above basic, with a performance gap between ELLs and non-ELLs

(72% non-ELL and 31% ELL were at or above basic). Basic is defined as the following:

"This level denotes partial mastery of prerequisite knowledge and skills that are

fundamental for proficient work at each grade" (National Center for Education Statistics,

2012b, para. 5). Texas state averages for the same test were similar with 70% of non-

ELLs and 36% of ELLs at or above basic (National Center for Education Statistics,

2014).

Ethically, educators must seek out best practices to better serve the educational

needs of this population. Dual language, also known as two-way immersion (TWI) is one

of the options used to serve bilingual students. This option is socially more acceptable

since language majority students are also able to participate in the program and

experience the many benefits in the same classroom as their LEP peers (Alanis &

Rodriguez, 2008; Palmer, 2010). "It is important to remember that two-way bilingual

programs are also multi-cultural programs, made up of not only middle class white and

low-income Latino students, but of children of diverse cultural, racial, and socioeconomic

backgrounds, in many different combinations" (Reyes & Vallone, 2007, p. 10). The two

dual language campuses that were examined in this study were representative of a diverse

group of students that reflect a variety of home languages, but all come together in the

dual language classroom to master English and Spanish.

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For the sake of this literature review, the terms dual language program, two-way immersion, two-way dual language, and dual language immersion will be considered synonymous.

When considering the most effective way to serve English language learners (ELLs), Collier and Thomas (2004) reported that dual language is the only program that closes the achievement gap for ELLs. In addition, the program is considered enrichment as opposed to remediation because of the intentional benefits built into the program to cultivate two languages (Collier & Thomas, 2004; Estrada, Gomez, & Ruiz-Escalante, 2009; Jong & Howard, 2009).

There are many types of programs that have been developed with second language acquisition as the goal but not all programs are focused on the maintenance and development of a student's first language. Genesee et al. (2005) examined years of empirical research dating back to 1980 and concluded there are many variations of support for ELLs through programs meant to develop their English and in many cases also develop their first language. Through the synthesis of the research he concluded that ELLs require some type of support given through a linguistic program to be successful even though the data show that bilingual programs are more effective than ESL (Genesee et al., 2005).

Mora et al. (2001) also examined programs ranging from those that provided English immersion only, transitional bilingual education that provided some instructional support in the native language, and the extreme enrichment additive nature of bilingual two-way dual language immersion. Through their research and the research of many others, they recognized that the goal of a dual language program is bilingualism and

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enrichment, but also produces higher academic gains for all students who participate in the program.

Dual language programs are commonly referred to as enrichment or additive models that respect and cultivate the language minority student's first and second language. Transitional bilingual programs or other models of mainstream bilingual education are recognized as deficiency or subtractive models because the goals of these programs are to eradicate the first language while replacing it with English (Ray, 2009).

Low socio-economic status has been a factor for ELLs who have been identified as at-risk for dropping out of school, therefore limiting their potential success. Lindholm-Leary and Block (2010) conducted research and examined students with low socio-economic status and found that for students participating in a dual language program, economics did not play a factor in their success.

There is a plethora of research and political debate regarding the most effective program to support the specific needs of ELLs. The justification for this research is framed around the desire to better serve the growing ELL population as well as all other children and equip them with language and cognitive skills that will give them choices in a competitive global society. Genesee, Lindholm-Leary, Saunders, and Christian (2006) emphatically state the critical nature of this research because so much is at stake. "ELLs who had not been in any specialized program but participated in mainstream English classes scored the lowest in comparison to students in any other program and ended their schooling with low levels of achievement" (2006, p. 181).

Knowledge and understanding of the programs is important as programming decisions are made for children and systems are created that produce higher achievement

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levels for ELLs and all students. While this literature review and research study will focus on measuring student success through achievement on state mandated tests, there are other measures that can and should be used to quantify the accomplishments of ELLs. Figure 2 is a visual representation of the topics covered in the literature review with a focus on programs serving ELLs and non-ELLs through dual language. Based on the focus of the current study, emphasis was placed on ELLs and non-ELLs participating in dual language and the variations in the programming parameters.
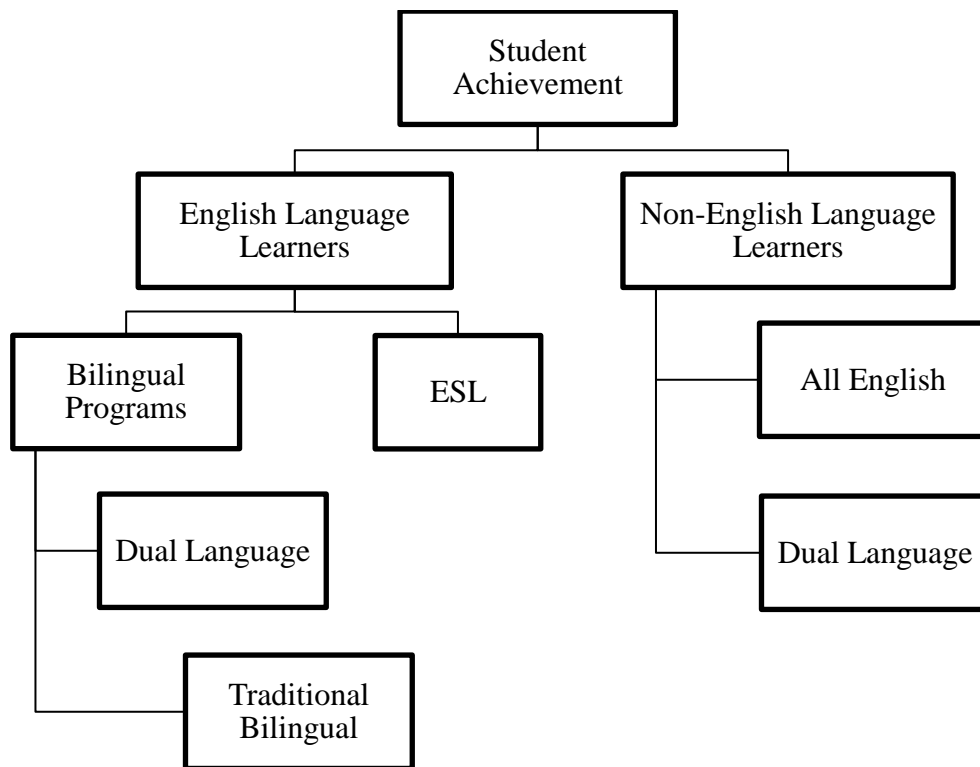
Figure 2. Literature map showing programs for ELLs and non-ELLs.

Programs for English Language Learners

Throughout the literature exploring dual language programs and bilingual education, there are many different models with variations to the instructional day. The

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variations of these models and the specific differences will be explained in greater detail with the focus on two categories of support that are approved methods in Texas (Seidlitz, Base, & Lara, 2014). The first category is bilingual programs. These programs are meant to develop English through the use of the student's native language and second language. The next category is ESL programs which are also meant to support English acquisition, but through the use of specific instructional techniques and scaffolding rather than the student's native language (Seidlitz et al., 2014). Through ESL programs, there is no development of the student's first language, rather only English. Table 2 outlines the two different types of programs and gives a description of the services (Seidlitz et al., 2014).

Table 2

Programs for English Language Learners

Service Type	Program	Description
Bilingual Program	Two-Way Dual Language Immersion 50:50	• ELLs and non-ELLs participate in the program. • All academic content is taught in both languages; each 50% of the time. • Bilingualism is the goal of the program.
Bilingual Program	Two-Way Dual Language Immersion 90:10	• The same description as 50:50, but in the early years the minority language is used 90% of the time to teach all academic content eventually transitioning to 50:50. • Bilingualism is the goal of the program.

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Bilingual Program	One-Way Dual Language Immersion	• ELLs receive instruction in minority language 50% of the time and majority language 50% of the time. Language is taught through the content. • Bilingualism is the goal of the program.
Bilingual Program	Transitional Bilingual	• Early instruction is predominately in the first language and eventually transitions to the point where the majority of the instruction is in English. • The goal is proficiency in English.
ESL	English as a Second Language (ESL)	• Student services are delivered by a trained ESL teacher in the English classroom, or through a pullout program. • The goal is proficiency in English.
Parent Denial	Mainstream English	• Due to the parent denial of services, the student is placed in an English classroom with no support.

Two-Way Dual Language Immersion 50:50

Two-way dual language programs are one method for meeting the unique instructional needs of bilingual students who are classified as LEP or as an ELL. The model is unique in that it includes students who are English dominant, with the language being taught through the content (Seidlitz et al., 2014; Thomas & Collier, 2012). The

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goal for two-way programs is to have 50% of the student population being native English speakers, and the other 50% of the students who speak the heritage language. With the mobility rates and changing demographics of schools, this can be an on-going challenge but Thomas and Collier (2012) state that for a program to be labeled two-way it must have at minimum one-third native English students and one-third of the students represented of the heritage language.

At times, there are also variations found in dual language models that apply to the language in which specific academic content is taught. For instance, in the 50:50 content model created by Dr. Leo Gomez and Dr. Richard Gomez, the timing varies based on the content, language of the day, and grade in which the student is enrolled (Gomez et al., 2005). In this model, mathematics is always taught in English, science and social studies are taught in Spanish, and reading, as well as language arts, has equal time in both languages (Estrada et al., 2009; Gomez et al., 2005). Regardless of the model of dual language immersion that is implemented, it is reported that the full development of a student's native language in conjunction with English is beneficial in many ways (Lindholm-Leary, 2004; Thomas & Collier, 2002, 2012).

Collier and Thomas (2004) consider two-way dual language immersion programs to be the only language program that can efficiently close the achievement gap for ELLs. All other programs have shown to achieve initial gains for the student as they acquire English, but as students move into secondary education the gap returns, with little hope of ever closing the gap (Collier & Thomas, 2004; Lindholm-Leary & Block, 2010).

In Thomas and Collier's 2002 study, they reported long term gains of ELLs who participated in effective two-way dual language programs. These students had greater

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success in English than their native English-speaking peers educated in all English instructional programs (Thomas & Collier, 2002).   The longitudinal study covered a span of five years (1996-2001) where the researchers gathered data from five districts and a total of 210,054 ELL students. Their sole purpose was to focus on long-term student achievement and use the data to make recommendations. Their results yielded the following recommendations:

1. Dual language or bilingual immersion programs are the only programs that provide the support that enables students to reach the 50th percentile in their first and second languages and experience long term achievement at this level. Students who participate in these programs are less likely to drop out of school.

2. Students who have little or no English should not be placed in a short term English immersion program. It takes a minimum of four years to develop and reach grade level performance in the student's second language (L2).

3. Students whose first language is well developed are more likely to be successful in the development of their second language.

4. Typically, students who receive 4-7 years of dual language schooling experience long term achievement gains.

5. Students who participate in some type of bilingual education outperform their peers who participate in English only programs (Thomas & Collier, 2002).

Lindholm-Leary (2001) reported a compilation of her research, specifically on dual language programs that began in 1986. She examined data from 20 schools that implemented dual language programs and synthesized the data from just under 4900

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students in the sample. The study included longitudinal data for a period of 4-8 years and included records for language minority (ELL) and language majority (non-ELL) students. She reported that all students participating in a dual language education program benefited from instruction in both languages.

 The achievement for the students was measured in both languages (English and Spanish) and progress was evident for all students regardless of ethnicity, socioeconomic status, gender, language background, or grade level. To summarize the many components of her study: students who participated in dual language achieved average to above average in reading as compared to their grade level peers (Lindholm-Leary, 2001).

In 2009, Thomas and Collier completed year one of a two year study for the North Carolina Department of Public Instruction. The study consisted of six school districts, with ten dual language schools that had been running dual programs for at least four years. The researchers dissected the student groups unlike their previous studies with the following groups used for comparison:

1. Limited English Proficient students (LEPs), divided into current LEP and former LEP,

2. Language Minority Students (LMNLs) who were never classified as LEP, and

3. Non-Language Minority Students (Non-LMs) who are native English speakers (Thomas & Collier, 2009).

Their findings supported previous research that LEP students (also referred to as ELLs) participating in dual language outperform their LEP peers in non-dual classes. Thomas and Collier also reported that former LEP students, meaning those who had been

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reclassified and were no longer considered limited English proficient, outscored their non-LEP peers in non-dual language classes.

Dual Language Two-Way Immersion 90:10

Dual language programs also vary in their specified instructional time in each language, remembering that the goal of literacy in both languages is always the anticipated outcome. Some models of dual language are 90:10 as students begin their study in both languages. This signifies that the students receive 90% of their instruction in Spanish and 10% in English with a gradual increase in English each year until the language of instruction is equal (50:50) with all of the content taught in both languages. A true 50:50 model stays consistent from the beginning of the students' schooling where 50% of their instruction is in English and 50% in Spanish with all content taught in both languages (Gomez, Freeman & Freeman, 2005; Lindholm-Leary, 2004; Thomas & Collier, 2012).

Sanders (2010) examined student achievement data from a large urban school district in southeast Texas where a 90:10 two-way dual language program was implemented at nine elementary campuses. She gathered data on a sample of 846 students from kindergarten through their fifth grade year. Her conclusions from the study indicated that by fifth grade, students enrolled in the two-way dual language program outperformed their peers in monolingual programs as measured by reading TAKS. She also reported, "By fifth grade, NSS [non-Spanish speaking] students enrolled in Two-Way Bilingual Immersion programs outperformed Waived NSS student enrolled in Regular Monolingual Education on the TAKS math and reading sections" (Sanders, 2010, p. 2).

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It should be noted that Sanders (2010) reported the opposite results in student achievement for those enrolled in both programs before fifth grade. She accounted for the difference due to the time it takes to acquire language, and in the case of students enrolled in the dual language program it takes time to meet and then exceed the achievement of peers who are learning in one language (Sanders, 2010).

One-Way Dual Language Immersion

The one-way dual language immersion model and the varied structures of the model are exactly the same as the two-way model except for the make-up of the student participants. In the case of one-way, all students speak the same primary (heritage) language. The same academic benefits are measured and reported in both one-way and two-way dual language immersion programs (Lindholm-Leary, 2004; Thomas & Collier, 2012).

Transitional Bilingual

Transitional bilingual programs are also meant to provide support to students who are identified as limited English proficient (LEP) with the goal of developing the students' English proficiency in listening, speaking, reading, and writing. Within this model, students receive instruction in their first language and English. As they progress through elementary, the percent of first language instruction decreases. Some transitional models exit students from the program as soon as two years (early exit) and others allow students to remain as long as seven years (late exit) depending on the needs of the student (Seidlitz et al., 2014). The major instructional difference between transitional bilingual programs and dual language programs is, "Transitional bilingual programs (both early

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exit and late exit) do not include the goal of maintaining the native language of the student" (Seidlitz et al., 2014, p. 13).

The study published by Montes (2005), reported similar results to Thomas and Collier's 2002 study but on a much smaller scale. He followed a cohort of 44 students for a total of four years, where half were enrolled in a 50:50 dual language program and the other half in a transitional bilingual program. The results reported were similar where students in dual language outperformed their peers as measured on TAKS reading at the end of their third grade year (Montes, 2005). In the study, all students passed the TAKS test, but 59% of the dual language students scored above state average as compared to 23% of the students in the transitional program (Montes, 2005).

English as a Second Language

English as a Second Language (ESL) is another method for supporting the language development of students who have limited English or are considered ELL. Generally, the program services are delivered in two settings with all services delivered in English. The first is a pullout model, where a certified ESL teacher provides services in the student's classroom, or they are pulled to another instructional area to focus on the preplanned objectives. The other method is content-based where the services are delivered in the classroom, but taught through the content with specific support strategies (Seidlitz et al., 2014).

The growth of the ELL population has increased research and recommendations for the improvement of ESL programs. The more effective programs target the three developmental areas of learners that include cognitive, academic, and linguistic domains. One technique that has been effective at closing the gap for ELLs in ESL programs is

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Sheltered Instruction Observation Protocol (SIOP). This term refers to focused strategies that support the language learner in the acquisition of English while learning content through the curriculum (Thomas & Collier, 2009). The techniques have been useful in scaffolding instruction for ELLs, but ESL programs focus only on developing student's linguistic skills in their second language (English).

Achievement of English Language Learners in Dual Language

More recently, Lindholm-Leary and Hernandez (2011) conducted a study that included 763 Latino participants in grades 4-8 who were dual language participants. The participants were selected from five public schools in California, with four schools having a 90:10 dual language program and one having a 50:50 dual language program. The students in the sample were classified into three categories. The first group of students (56%) was native Spanish speakers who entered school and were classified as English language learners (ELLs). The next group of students (24%) was similar to the first, in that they entered school and were classified as ELL, but had been reclassified as fluent English proficient (RFEP). The last group of students (20%) entered school as English proficient, even though they were from Latino homes.

The quantitative measurement used for the achievement portion of the study was the English Language Arts subtest of the California Standards Test (CST). Lindholm-Leary and Hernandez reported that the results from their study are consistent with previous research reported in this literature review. Overall, the students who participated in the dual language program achieved at or above their peers in English mainstream. This includes all of the subgroups listed above, with the RFEP students who

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scored the highest in almost all analyses conducted in the study (Lindholm-Leary &
Hernandez, 2011).

In a dual language program, both languages are developed as the student
progresses through the program which means there is no need for watered down
curriculum that is sometimes evident in transitional bilingual or English only programs.
As stated before, one of the biggest predictors for academic success is for students to
receive formal schooling in their native language (Alanis & Rodriguez, 2008; Collier &
Thomas, 2004; Lindholm-Leary & Block, 2010). Ray (2009) recognized the academic
benefits that are derived for students who participate in a dual language program. Even
students who are segregated in their communities based on their low socio-economic
status attain the benefits from acquiring two languages and are achieving at comparable
or higher than their monolingual peers (Lindholm-Leary & Block, 2010).

The research supported the effectiveness of one-way and two-way dual language
programs and the researchers believe that these are the only types of programs where it is
commonplace to have English language learners outperforming their native English
speaking peers (Collier & Thomas, 2004; Lindholm-Leary, 2001). Long term studies
seem to indicate that ELLs who remain in programs for extended periods of time with
continued support have better achievement outcomes in reading and math as well as
higher GPA's, better attendance rates, and higher graduation rates as compared to those
with no program support (Genesee, 2005; Lindholm-Leary, 2001; Thomas & Coller,
2002).

Through these programs students are learning the language through the content
rather than through isolated vocabulary instruction (Wu, 2004). Advocates of dual

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language believe that skills obtained in one language transfer to the second language and are available for access to the learner. With that being said, the structure of a dual language classroom allows students to immediately begin the use of the second language since the teaching of the language is done through the academic content and not isolated to a time slot in the day designated for Spanish instruction (Estrada et al., 2009).

Achievement of Language Majority Students (Non-ELLs)

The goal for all students in a successful dual language program is bilingualism, bi-literacy, and cultural awareness that usually results in enhanced cognition and higher achievement (Collier & Thomas, 2004; Lindholm-Leary & Block, 2010). The language majority students receive many of the same benefits that the English language learners receive through participating in the dual language program. In a true 50:50 dual language program, it is the goal to deliver half of the instruction in English and the other half in Spanish. In addition, it is the goal to have half of the students being language minority (students whose second language is English) and the other half language majority (students whose first language is English). The mix of linguistic abilities is shown to benefit all students in the classroom. (Collier & Thomas, 2004; Lindholm-Leary & Block, 2010).

Students begin actively participating in class and using their second language immediately as they learn the content with their language minority classmates and their English language foundation supports their learning in their new language (Estrada et al., 2009). Estrada et al. (2009) point out those students who participate in dual language generally achieve at proficiency or higher on assessments in math, reading, and writing.

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Collier and Thomas (2004) consider dual language programs to be the most effective academic program to increase achievement in all students who are participating, not just ELLs. Those students who participate in effective dual language programs enjoy higher cognition rates, increased creativity, and higher analytical thinking skills (Thomas & Collier, 2003).

Thomas and Collier (2009) worked with the North Carolina Department of Public Instruction and reported favorable findings for the performance of students that were limited English proficient (LEP) and for language majority students (native English speakers) who were participating in dual language programs across six districts. They reported that white language majority students who participate in dual language outscore their white peers in non-dual programs. Furthermore, the study was conducted for two years and they reported that by middle school, all students in every subgroup examined was performing at or above their peers who are enrolled in non-dual instructional settings (Thomas & Collier, 2010).

The study conducted by Porter (2014) confirms the previous information presented by Thomas and Collier positing that all students who participate in dual language are more successful than those who do not. Porter's study focused on the academic performance of English dominant seventh and eighth grade students who participated in a dual language program in Texas and were coded in the Public Education Information Management System (PEIMS) in the 2009-2010 school year.

Students included in the random sample had to meet the eligibility requirements to take the STAAR test. Both reading and math scores were extrapolated and compared to a control group made up of students who had no record of dual language participation.

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The two groups were mirrored in size in all aspects including ethnicity and economically disadvantaged participants. The seventh grade sample included 440 English dominant dual language students and 440 students in the control group. The eighth grade sample included 285 English dominant dual language students and the exact same number in the control group. Porter (2014) reported a significant statistical difference between the English dominant students in dual and the control group, with the dual language seventh and eighth grade students achieving significantly higher in reading and math. His results mirror previous studies presented in the current literature review.

Not all studies focused on dual language report significant differences in student achievement between dual language participants as compared to state averages of their English speaking peers. Jayroe (2013) conducted a unique study that examined language majority fourth grade White and African American students who were enrolled on campuses who are registered as two-way dual language immersion campuses. Jayroe compared the means of the two demographic groups to the state mean on the fourth grade 2011 reading TAKS test and reported that there were no significant differences in performance. He also examined commended rates on the same test and reported a significant difference with White students performing below the state average and no significant difference in the commended rate for African American students (Jayroe, 2013).

In most learning environments, low socio-economic status (SES) is a predetermining factor in the success of students; however, Lindholm-Leary and Block (2010) found that SES did not affect the positive outcomes derived from participation in a dual language program. Additionally, Thomas and Coller (2010) reported that low SES

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could be attributed to low student achievement, though the findings from their two year study in North Carolina provide more information. They reported that limited English proficient and African American students who participated in dual language, who were also low SES outperformed their peers who were non-dual language in reading and math (Thomas & Collier, 2010).

Table 3 is a summary of the research studies highlighted in Chapter 2. The table is formatted in chronological order with specifics about each study as well as a brief description of the result.

Table 3

Summary of Research Studies

Researcher(s)	Date	Population and Program	Results
Lindholm-Leary	1986	20 schools 4900 students Followed students for 4-8 years	Students in dual language achieved average to above average in reading as compared to their peers
Thomas and Collier	1996-2001	Two-way dual language Five districts 210,054 students	Dual language programs produced the highest results
Montes	2005	44 students Half in 50:50 dual Half in Transitional bilingual program	Students in dual language outperformed their peers as measured by 3rd grade TAKS

Thomas and Collier	2009-2010	6 School districts in North Carolina Ten dual language schools 103,121 students Grades 3-8	All groups examined in the study had a positive effect based on participation in dual language as compared to non-dual language peers.
Sanders	2010	846 students Nine campuses Kindergarten - Fifth	Fifth grade students outperformed their peers on TAKS reading, whereas results before fifth grade were the opposite
Lindholm-Leary and Hernandez	2011	763 Latino participants in grades 4-8 Five public schools	Overall the students who participated in dual language achieved at or above their peers
Jayroe	2013	83 campuses that were listed in the Texas Two-Way Directory Language majority fourth graders (White and African American)	White and African American students who were enrolled on campuses designated to offer two-way dual language performed equivalent to the state averages on 2011 TAKS reading test
Porter	2014	725 Seventh and Eighth Graders in Texas Coded English Dominant (Non-ELLs)	English dominant students in dual language scored significantly higher on STAAR than students in a mirrored control group

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Additional Research

There is a need for additional research based on previous studies, and based on the specific needs in the researcher's district. To begin, the district where the current study was completed launched a two-way dual language pilot program in the fall of 2003. The program was expanded to another campus in the fall of 2005. The program was expanded on the two campuses by adding one grade level each year starting with kindergarten through fifth grade. The program has since been expanded into middle school and high school, with the first graduates planned for 2017.

Since the beginning of the program there has been little targeted research and evaluation regarding the effectiveness of the program. Additionally, many researchers in the field have expressed the need for additional research to expand the knowledge base regarding ELLs due to the growing population and other students participating in the program (Lindholm-Leary & Block, 2010).

Fralick (2007) suggested the continuation of research and the comparison of dual language programs with other bilingual programs targeted to support ELLs. She also suggested including other academic areas in future research to give a more comprehensive academic achievement picture for students participating in bilingual programs (Fralick, 2007).

Montes (2005) suggested the implementation of dual language programs nationwide, specifically for those areas of the country that are heavily populated with English language learners. For this to occur, additional research must be conducted to determine the most effective programs as well as best practices to effectively serve the language minority and language majority students. As future researchers examine the

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measurable benefits of two-way dual language immersion, Genesee et al. (2005) recommended additional research be conducted on the co-development of oral language skills, literacy, and academic skills in students first and second language.

In a recent study Jayroe (2013), called for further research that investigates the success of the language majority students (non-ELLs) participating in dual language with a comparison against state averages (Jayroe, 2013). Dependent upon when the snapshot is taken, a student could be classified one year as an ELL and in the next school year a non-ELL, due to reclassification. Lindholm-Leary and Hernandez (2011) reported on a group of Latino dual language students who were considered at-risk, but were achieving at or above their English main-stream counterparts. Research such as Lindholm-Leary and Hernandez's (2011) is important and valuable information for policy makers and school leaders. They advocated for additional research that examines the changing classifications of students who participate in the dual language program as compared to their peers who are in classrooms with all English instruction (Lindholm-Leary & Hernandez, 2011).

Porter (2014) observed that there are enormous amounts of research regarding the participation of ELLs in dual language and their achievement; however, there are few studies that have truly focused on the language majority or English dominant students who participate in dual language programs. He suggests that there is a need for added research with this population as well as other ethnic groups.

The current study will attempt to fill the gaps regarding the effectiveness of the two-way dual language program, specifically pertaining to the district where the research was conducted. It will also contribute to the body of knowledge so that education

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practitioners can use the data to guide future instructional decisions regarding the

implementation of a two-way dual language program and the effectiveness of the

program as measured by the new Texas assessment tool (STAAR).

CHAPTER 3. METHODOLOGY

Introduction

State and federal assessments reported that English language learners (ELLs) are underperforming in math and reading when compared to their monolingual peers (National Center for Education Statistics, 2012). The reality of this problem puts the responsibility on educators to find ways to close the achievement gap and provide support for language learners.

To quantify the problem, in the state of Texas, 52% of all ELLs met the minimal phase-in standard in reading on the State of Texas Assessment of Academic Readiness (STAAR) in 2013, as compared to 89% of all white students who met the minimal standard (Texas Education Agency, 2013f). Locally, the gap for these two groups was smaller (30%), but still reflected a great need to research instructional practices that will promote higher learning outcomes for all students in the local school district where the focus of the current research was conducted (Texas Education Agency, 2013e).

The purpose of the present study was to investigate the outcomes of an established two-way dual language program that was implemented on two campuses in the local school district. The researcher examined reading and math achievement data as measured by the STAAR test and made comparisons between three groups: students who were classified as English language learners (ELLs) who participated in dual language,

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non-ELLs who participated in dual language, and students (ELL and non-ELL) who were enrolled in classes where the instruction was all English.

The research questions that were addressed in the study are as follows:

1. Are students who participate in dual language (ELLs and/or non-ELLs) in a large North Texas school district more successful academically in reading and math than their peers who receive all instruction in English as measured by the STAAR test?

1. Are ELL students who participate in dual language more successful in reading and math than ELL students who participate in other bilingual models in a large North Texas school district as measured by the STAAR test?

2. Are non-ELL students (language majority) who participate in dual language in a large North Texas school district more successful in reading and math than non-ELL students in the district who receive all instruction in English as measured by the STAAR test?

Research Design

The design of the study was causal-comparative and considered *ex post facto* since the data was collected after the programs had already been implemented (McMillan, 2012).

The rationale and purpose behind this study was to evaluate the performance of fifth grade ELLs and non-ELLs participating in the Two-Way Dual Language program in a large urban North Texas school district as measured by the State of Texas Assessment of Academic Readiness (STAAR) in comparison to their fifth grade peers who receive all instruction in English.

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In addition, the researcher compared the achievement of students participating in the Two-Way Dual Language program who were identified as English language learners with the average for students participating in other bilingual programs across the district who were also identified as English language learners (ELLs). Three years of assessment data was gathered (2012-2014) and evaluated. To evaluate the achievement of language majority students (non-ELLs) in dual language, a comparison was made with the district average of language majority students who were in all English classrooms.

Target Population and Sample

The participants were the entire population of fifth grade students from the two dual language campuses in the local school district for the three designated years. Enrollment data was collected to determine that all participants had been continuously enrolled in one of the two schools from their kindergarten, first, or second grade year. All students who fit the criteria were included as a part of the sample; therefore, random sampling methods were not used, the whole population was included. Data for three groups of students was collected that included fifth grade students who were enrolled during the 2011-12, 2012-13, 2013-14 school years.

The students were assigned to the following groups: (1) students who were classified as ELLs who were participating in dual language, (2) students who were non-ELLs who were participating in dual language, and (3) students who were ELLs and non-ELLs enrolled in the monolingual (all English instruction) program.

The researcher used the entire population of students who qualified at the two campuses in the two-way dual language program as well as the students enrolled in the

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monolingual program. The following criteria were used for inclusion in the current

study:

1. Dual language students who were enrolled from kindergarten, first, or second
   grade through the fifth grade at either dual language campus.

2. Monolingual students who were enrolled at the campus during their fifth
   grade year and enrolled in the district from kindergarten, first, or second grade
   through fourth grade.

3. Students who fit the previously stated criteria in 1 or 2 and also remained
   enrolled and were not withdrawn for more than four weeks at any time.
   (Students left the district for a variety of reasons for extended vacation or
   travel that at times exceeded four weeks and were not enrolled in school
   during that time.)

Next, the researcher assigned each campus a letter (A and B), and each of the participants

of the target population were assigned a number to protect their anonymity. For the

purpose of the study, all data was secondary and written permission to collect the data

was provided by the school district. Protection of human participants training was

completed by the researcher and the proposal was submitted to the Dallas Baptist

University's Committee for the Protection of Human Participants for the appropriate

approval. Approval to complete the study was provided to the researcher in writing and

will be retained for five years.

Setting

The setting for the study was a large urban school district, which was located in

North Texas between the cities of Dallas and Fort Worth. The district enrollment was

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34,961 in 2012-2013, with 81.5% of students identified as economically disadvantaged, 39.4% ELL, and 68.5% considered at-risk (Texas Education Agency, 2013d). Table 4 displays the specific demographic data that described the two campuses included in the study as well as the district. All data were recorded in percentages (Texas Education Agency, 2013cd).

The specific dual language program that was implemented at the two local campuses was a 50:50 two-way program. The two languages implemented were English and Spanish and attempts were made to ensure a balance of participants (50% native Spanish speakers and 50% native English speakers). All content was taught in both languages with the parameters of the program defined for staff at both campuses.

The remaining elementary schools in the large North Texas school district were serving bilingual students using a more traditional model. Over the duration of the three testing years, the district was using a transitional model in 2012 and in the following year began the move to a bilingual enrichment model. The features of this model looked similar to a 50:50 model in kindergarten through fourth grade, without the participation of language majority students. In 2014, the district delayed any additional changes to the model which has enabled them to continue their research into best practices for serving bilingual and ESL students.

Table 4

Dual Language Campus Demographics (Percentages)

Demographic	Campus A	Campus B	North Texas District
Economically Disadvantaged	71.8	79.7	81.5
English Language Learners	42.0	47.3	39.4
At-Risk	77.1	70.6	68.5
Mobility Rate	20.9	12.2	Not reported at the district level
Hispanic	59.9	74.4	71.5
African American	10.1	8.4	12.9
White	18.3	14.1	10.1
American Indian	0.6	0.5	0.8
Asian	9.3	0.8	3.3
Pacific Islander	0.2	0.1	0.2
Two or more	1.6	1.7	1.2

Instrumentation and Measures

The State of Texas Assessment of Academic Readiness (STAAR) assessment was used in the study as a measure of students' academic achievement in reading and math.

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The first administration of STAAR was given in the spring of 2012 and replaced the Texas Assessment of Knowledge and Skills (TAKS).

The administration of STAAR was mandated by the state and passing rates determined the district and campus accountability ratings. Students in grades 3-5 are assessed annually in reading and math, writing is assessed in grade 4, and in grade 5 students are assessed in science (Texas Education Agency, 2014). The new accountability system also had specific assessment requirements for secondary students that were not outlined in this document.

The STAAR assessment was developed with a focus on readiness standards and is considered more rigorous than the previous testing program. The readiness standards were essential knowledge and skills that created foundational knowledge for the next grade or course, and prepares the student for college and career pathways (Texas Education Agency, 2014).

Vogt (2007) states that "Reliability and validity are important aspects of all research designs and measurement techniques" (p. 113). For the purpose of this study, reliability and validity must be determined in regard to the measurement tool, which was the STAAR test. The characteristics should be examined separately beginning with reliability, which refers directly to the consistency of the measurement. If the test or assessment is proven reliable it will generally yield the same results under the same conditions. In addition, if the instrument or experimental design were used by multiple researchers for the same purpose, all should achieve similar results (Yogt, 2007).

Validity refers to the degree to which the assessment measures what it was created to measure. If the design is valid, the measurement tool or experimental design

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will yield the results that tell the researcher what they want to know about their subject (Vogt, 2007).

In the Texas Education Agency (TEA) Standard Technical Process Manual, it was noted that some methods for measuring reliability required multiple administrations to the same subjects. However, for STAAR, estimation methods of reliability were developed and used that required only one administration (Texas Education Agency, 2013a). STAAR and STAAR Modified, as well as other state assessments, were used to determine students' understanding of the Texas Essential Knowledge and Skills (TEKS). Therefore the test makers were required to gather evidence that supports the validity of these conclusions (Texas Education Agency, 2013). Based on this information, the researcher assumed that the STAAR test was a valid and reliable instrument to measure student achievement and acquisition of the TEKS.

Data Collection

The data for students in each group was collected at the campus level and any identifying information that could be directly or indirectly linked to a student was redacted. The researcher used the STAAR Confidential Campus Roster (reading and math) from the May administration of the 2011-12 school year to collect achievement data. For the 2012-13 and 2013-14 school years, the researcher used STAAR testing data from the April and May administrations.

To verify enrollment, the researcher accessed the Public Education Information Management System (PEIMS) to determine student status and determine in which research group the students should be placed (ELL in dual language, non-ELL in dual language, English only program). The researcher collected the data in a manner that

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ensured confidentiality of all participants by redacting information that might link the data to the sample participants (example: name and student identification number).

The campus reports that were used to gather data pertaining to other bilingual programs were published by the Texas Education Agency. For 2011-12 data, the researcher used the Academic Excellence Indicator System (AEIS) Campus Performance report and for 2012-13 and 2013-14, the researcher used the Texas Academic Performance Report (TAPR) Campus Performance Report. The use of two different documents was required as the state of Texas changed the report name in the 2012-13 school year in which state, district, and campus data were reported to the public.

The data for this study was secured and stored in the researchers' locked desk drawer at work or locked storage container in the home during the study. After completion of the study, all data was stored in the home of the researcher in the locked container and will be kept for five years. After the designated date, the data will be destroyed.

Procedures and Data Analysis

The current study was a causal-comparative study. The independent variables were the dual language program and monolingual program, with the dependent variable as student performance data (STAAR results in math and reading). As an ex-post-facto design, the cause and effect have already occurred and the data was already available for analysis (Fraenkel & Wallen, 2009). Based on the design, no experimentation occurred in the study.

The following questions were addressed in the study with the corresponding hypotheses that are listed separately for each content area (reading and math). A short

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narrative follows each question with specifics about the required statistical test that was performed and how the test was analyzed.

Research Question 1 (RQ1)

Are students who participate in dual language (ELLs and/or non-ELLs) in a large North Texas school district more successful academically in reading and math than their peers who receive all instruction in English as measured by the STAAR test?

$H1_0$: There will be no statistically significant difference in the mean of fifth grade reading STAAR scores of ELLs in Dual Language, non-ELLs in Dual Language and students receiving their instruction in all English.

$H1$: At least one of the population means for STAAR reading is different.

$H2_0$: There will be no statistically significant difference in the mean of fifth grade math STAAR scores of ELLs in Dual Language, non-ELLs in Dual Language and students receiving their instruction in all English.

$H2$: At least one of the population means for STAAR math is different.

The operational (null) hypothesis (H_0) for RQ1 was that there is no difference as measured by the STAAR reading and math assessment between the three groups examined in the study:

1. English language learners (ELLs) participating in dual language,

2. Non-English language learners (non-ELLs) participating in dual language,

3. Students who receive their instruction in all English (ELLs and non-ELLs).

The alternative hypothesis ($H1$) suggests that there was a difference in one of the three groups listed above on the STAAR reading and math assessment.

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A one-way between subjects analysis of variance (ANOVA) was used to compare the means of the three groups designated for the first research question to determine if there was a significant difference between the three groups at the two dual language campuses (Yockey, 2008). Significant statistical differences were determined at a confidence level of .05 ($p < .05$). Yockey (2008) stated that ANOVA "is used when the means of two or more independent groups are compared on a dependent variable of interest" (p. 91).

If a significant difference was found, a Tukey post-hoc test was also conducted to determine which pair-wise combination of groups was significant. The data for the three groups was formatted using the Statistical Package of Social Sciences (SPSS) software, with the independent variable designated as the group where students are assigned and the student's STAAR score as the dependent variable. The data was entered for reading and math and analyzed using SPSS and the results interpreted for 2011-12, 2012-13, and 2013-14.

Research Question 2(RQ2)

Are ELL students who participate in dual language more successful in reading and math than ELL students who participate in other bilingual models in a large North Texas school district as measured by the STAAR test?

H3_0: There is no statistically significant difference in the mean of fifth grade reading STAAR scores of ELLs in Dual Language and ELLs who participate in other bilingual models in the district.

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H3: There is a statistically significant difference in the mean of fifth grade reading STAAR scores of ELLs in Dual Language and ELLs who participate in other bilingual models in the district.

$H4_0$: There is no statistically significant difference in the mean of fifth grade math STAAR scores of ELLs in Dual Language and ELLs who participate in other bilingual models in the district.

H4: There is a statistically significant difference in the mean of fifth grade math STAAR scores of ELLs in Dual Language and ELLs who participate in other bilingual models in the district.

The operational (null) hypothesis (H_0) for RQ2 was that there was no difference as measured by the STAAR reading and math assessment between ELLs participating in dual language and the mean of all other students in the North Texas school district who participated in other bilingual programs in the same district. The alternative hypothesis suggested that the two groups were not equal. A one-sample t-test was conducted to compare ELLs STAAR scores in reading and math to the district mean. If the null hypothesis (H_0) was rejected then the researcher calculated the effect size to determine the degree or magnitude of the result. When necessary, Cohen's guidelines were used to determine the degree of small, medium, or large effect size (Yockey, 2011).

Significant statistical differences were determined at a confidence level of .05 (*p* < .05). The data for ELLs participating in dual language was formatted using the Statistical Package of Social Sciences (SPSS) software, with the STAAR score designated as the dependent variable.

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Research Question 3 (RQ3)

Are non-ELL students (language majority) who participate in dual language in a large North Texas school district more successful in reading and math than non-ELL students in the district who receive all instruction in English as measured by the STAAR test?

$H5_0$: There is no statistically significant difference in the mean of fifth grade reading STAAR scores of non-ELLs in Dual Language and non-ELLs in the district.

H5: There is a statistically significant difference in the mean of fifth grade reading STAAR scores of non-ELLs in Dual Language and non-ELLs in the district.

$H6_0$: There is no statistically significant difference in the mean of fifth grade math STAAR scores of non-ELLs in Dual Language and non-ELLs in the district.

H6: There is a statistically significant difference in the mean of fifth math STAAR scores of non-ELLs in Dual Language and non-ELLs in the district.

The operational (null) hypothesis (H_0) for RQ3 was that there was no difference as measured by the STAAR reading and math assessment between non-ELLs who participated in dual language as compared to non-ELL students in the district who received all instruction in English. The alternative hypothesis suggested that the two groups were not equal. A one-sample t-test was conducted to compare non-ELLs STAAR scores in reading and math to the district mean. Therefore, if the null hypothesis (H_0) was rejected based on the result, the researcher calculated the effect size to determine the magnitude of the result. When necessary, Cohen's guidelines were used to determine the degree of small, medium, or large effect size (Yockey, 2011).

Significant statistical differences were determined at a confidence level of .05 ($p < .05$). The data for non-ELLs participating in dual language was formatted using the

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Statistical Package of Social Sciences (SPSS) software, with the STAAR score designated as the dependent variable.

All data was compiled to allow the researcher to analyze the results from each individual year and the patterns from the three years of data in both reading and math. Particular attention was given to tests yielding results that were statistically significant.

Ethical Considerations

The current study is viewed as action research since the researcher had direct access to a portion of the student data based on her position. To ensure the reliability of the data and statistical results, the topic for the current study was determined years in advance and at no point did the researcher attempt to disaggregate the data in any way that would compromise the integrity of the study.

Because of the nature of the action research study, the resulting data could be viewed as political in nature due to differing opinions regarding the best way to serve students who are in bilingual and ESL programs. It was always the intent of the researcher to complete the study for the ultimate benefit of the large North Texas school district, with the final beneficiary being the students of the district in the current study. This will be achieved if the data is used to shape future programming decisions that will promote student achievement. The information will be shared with district leadership to determine the most appropriate use of the data and the specific campus information will remain confidential.

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CHAPTER 4. RESULTS

Introduction

This chapter presents the results of the quantitative causal comparative study to determine achievement differences for three student groups at the north Texas school district where a 50:50 two-way dual language program is offered at two campuses. The fifth grade student groups include English language learners (ELLs) participating in dual language, non-English language learners (non-ELLs) participating in dual language, and students who receive all of their instruction in English (monolingual). Data analysis determined if there are statistically significant differences among the three groups in reading and math as measured by the State of Texas Assessment of Academic Readiness (STAAR).

Next, data analysis determined if there were significant differences between ELL students in dual language as compared to the mean of ELL students in the district who participated in a traditional bilingual program in reading and math as measured by STAAR.   In addition, the study examined non-ELL students who participated in dual language as compared to the mean of non-ELL students in the district who receive all of their instruction in English for reading and math, as measured by STAAR.

Data analysis sought to answer the following research questions:

1. Are students who participate in dual language (ELLs and/or non-ELLs) in a large North Texas school district more successful academically in reading and

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math than their peers who receive all instruction in English as measured by the STAAR test?

2. Are ELL students who participate in dual language more successful in reading and math than ELL students who participate in other bilingual models in a large North Texas school district as measured by the STAAR test?

3. Are non-ELL students (language majority) who participate in dual language in a large North Texas school district more successful in reading and math than non-ELL students in the district who receive all instruction in English as measured by the STAAR test?

Description of the Population

Students in the population included all fifth grade students from the two dual language campuses in the north Texas school district who fit the following criteria for inclusion:

1. Dual language students who were enrolled from kindergarten, first, or second grade through the fifth grade at either dual language campus.

2. Monolingual students who were enrolled at the campus during their fifth grade year and enrolled in the district from kindergarten, first, or second grade through fourth grade.

3. Students who fit the previously stated criteria in 1 or 2 and also remained enrolled and were not withdrawn for more than four weeks at any time. (Students left the district for a variety of reasons for extended vacation or travel that at times exceeded four weeks and were not enrolled in school during that time.)

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All students enrolled at the dual language campuses and in the district received instruction based on the same scope and sequence that was aligned with the Texas Essential Knowledge and Skills (TEKS). In addition, all district teachers used similar materials and resources to deliver their instruction.

The Enrollment for students was verified through the Public Education Information Management System (PEIMS) and all students who met the identified criteria were included in the study and then coded for one of the three groups: 1) ELL student participating in dual language, 2) non-ELL student participating in dual language, or 3) student receiving all instruction in English (ELL or non-ELL). Any student who exited limited English proficient (LEP) previous to the fifth grade was coded as a non-ELL student.

Two campuses from the local school district were represented in the study. Campus A had a total of 324 fifth grade students who took the English STAAR reading assessment and 326 who took the English STAAR math assessment in the three years represented in the study. After the examination of PEIMS enrollment records, there were 217 students in reading and 218 students in math who met the criteria for inclusion in the study. In the same three years, campus B had 359 fifth grade students who took the English STAAR reading assessment and 368 who took the English STAAR math assessment with 261 students who met the criteria for inclusion in reading and 269 for math. See Tables 5 and 6 for a detailed summary of the population and groups.

For the purpose of the study, the data from Campus A and Campus B were combined based on the three designated groups, and statistical tests were completed for

each research question and hypothesis. All statistical tests were completed using IBM

Statistical Package for Social Sciences (SPSS), version 22.

Table 5

Detailed Composition of Campus A Population

Campus A Reading	Total # in Population	# That Met Criteria for Inclusion	# ELL in Dual	# of Non-ELL in Dual	# of Students in English Only
2012	121	83	17	28 (0*)	38 (2**)
2013	107	63	5	31 (9*)	27 (6**)
2014	96	71	18	29 (10*)	24 (2**)
Campus A Math					
2012	121	82	17	28 (0*)	37 (2**)
2013	107	65	5	32 (9*)	28 (7**)
2014	98	71	18	29 (10*)	24 (2**)

(*) The number of 1st and 2nd year monitors included in the group

(**) The number of ESL, 1st and 2nd year monitors included in the group

Table 6

Detailed Composition of Campus B Population

Campus B Reading	Total # in Population	# That Met Criteria for Inclusion	# ELL in Dual	# of Non-ELL in Dual	# of Students in English Only
2012	134	104	21	39 (7*)	44 (3**)
2013	116	91	15	43 (16*)	33 (3**)
2014	109	66	15	19 (1*)	32 (1**)
Campus B Math					
2012	135	104	21	38 (7*)	45 (4**)
2013	123	96	19	45 (17*)	32 (3**)
2014	110	69	18	19 (1*)	32 (1**)

(*) The number of 1st and 2nd year monitors included in the group

(**) The number of ESL, 1st and 2nd year monitors included in the group

Presentation of Findings

Research Question and Hypothesis 1

Research question one posits: Are students who participate in dual language (ELLs and/or non-ELLs) in a large North Texas school district more successful academically in reading and math than their peers who receive all instruction in English as measured by the STAAR test?

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The operational (null) hypotheses ($H1_0$ and $H2_0$) for RQ1 are that there is no difference as measured by the STAAR reading and math assessment between the three groups examined in the study:

1. English language learners (ELLs) participating in dual language,

2. Non-English language learners (non-ELLs) participating in dual language,

3. Students who receive their instruction in all English (ELLs and non-ELLs).

The alternative hypotheses (H1 and H2) suggest that there is a difference in one of the three groups listed above on the STAAR reading and math assessment.

A One-Way between Subjects Analysis of Variance (ANOVA) was used to compare the means of the three groups designated for the first research question to determine if there was a significant difference between the three groups at the two dual language campuses (Yockey, 2011). Care was taken to ensure that the three assumptions were met for using the ANOVA. The design of the study helped ensure that the observations were independent and normal distribution was tested through the use of a Shapiro-Wilk test in SPSS. In the case when the population was found to be non-normal and the assumption violated, the researcher verified that the sample size met the criteria of 30 or more to prevent impact on the results of the test (Pallant, 2010; Yockey, 2011).

For the final assumption, a Levene's test was used to determine if equal variances could be assumed for the three groups. This was determined by reading the *p*-value on the SPSS table titled Test of Homogeneity of Variances. If the *p*-value is greater than .05, than the null hypothesis is not rejected and equal variances are assumed. If the p-value is less than .05 equal variances cannot be assumed.   If the null hypothesis was rejected, a Tukey post hoc test was used to determine the significant difference between

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the groups. If significance is determined, an effect size was calculated with an eta

squared (η^2) test for variance. The conventions for Eta-squared were applied for a small

(.01), medium (.06), and large (.14) effect size based on Cohen's guidelines (Yockey,

2011). Significant statistical differences were determined at a confidence level of .05 (p

< .05). A total of six ANOVA's were performed using students STAAR data (scale

score) for three testing years (2012, 2013, and 2014) in both reading and math.

2012 Reading ANOVA

A One-Way between Subjects ANOVA was used to examine 2012 reading

STAAR data and determine if student scale scores were a function of the programs

offered at the local dual language campuses (combined scores from Campus A and B).

The dependent variable was the students' STAAR scale score and the independent

variable was the program (ELLs in dual language, non-ELLs in dual language, and

students receiving all instruction in English). The results for Levene's test of

homogeneity of variances provided a p-value > .05 (.561), therefore equal population

variances were assumed. The sample size (N), mean, and standard deviation are reflected

in Table 7 for each program group. The ANOVA, which is reflected in Table 8, yielded a

p-value that was < .05 (.000) indicating a significant difference between one of the

groups, rejecting the null hypothesis.

The STAAR scale score varied by program, $F (2, 184) = 35.86$, $p < .05$, $\eta^2 = .28$,

Tukey's post hoc procedure indicated that Non-ELLs in Dual Language ($M = 1599.37$,

$SD = 105.29$) achieved a significantly higher scale score in reading than those who

received instruction in all English ($M = 1495.81$, $SD = 110.09$). In addition, students who

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received instruction in all English achieved a significantly higher reading scale score than

ELLs in Dual language ($M = 1435.61$, $SD = 71.06$).

Table 7

Reading 2012 Mean and Standard Deviation of Scale Scores

Program	N	Mean	Standard Deviation
ELL in Dual	38	1435.6053	71.05595
Non ELL in Dual	67	1599.3731	105.29192
All English	82	1495.8171	110.09313
Total	187	1520.6845	119.15699

Table 8

Analysis of Variance for 2012 Reading STAAR Scores

Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	740627.378	2	370313.689	35.857	.000
Within Groups	1900273.007	184	10327.571		
Total	2640900.385	186			

2013 Reading ANOVA

A One-Way between Subjects ANOVA was used to examine 2013 reading

STAAR data. The dependent variable was the students' STAAR scale score and the

independent variable was the program (ELLs in dual language, non-ELLs in dual

language, and students receiving instruction in all English). The sample size (N), mean,

and standard deviation are reported in Table 9 for each program group.

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The results for Levene's test of homogeneity of variances provided a *p*-value <
.05 (.031), therefore equal population variances were not assumed and the required
assumption violated. To account for this, the analysis was rerun using a Welch test and a
Dunnett's T3 post hoc test. The Welch test that is reported in Table 10 indicated that
there was a significant difference (p < .05) between one of the program groups, therefore
the null hypothesis was rejected and the post hoc test was evaluated. This affirmed the
previous result from the ANOVA test.

The STAAR scale score varied by program, F (2, 154) = 22.557, p < .05, η^2 = .23,
Dunnett's T3 post hoc procedure indicated that those who received instruction in all
English (*M* = 1525.73, *SD* = 93.83) and non-ELLs in dual language (M = 1542.46, SD =
74.28) achieved a significantly higher scale score than ELLs in Dual Language (*M* =
1407.15, *SD* = 56.44).   There was no significant difference between students in all
English and non-ELLs in dual language.

Table 9

Reading 2013 Mean and Standard Deviation of Scale Scores

Program	N	Mean	Standard Deviation
ELL in Dual	20	1407.1500	56.44119
Non ELL in Dual	74	1542.4595	74.27627
All English	60	1525.7333	93.82762
Total	154	1518.3701	91.33261

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Table 10

Reading 2013 Robust Test of Equality of Means

	Statistic[a]	df1	df2	Sig.
Welch	40.477	2	61.517	.000

a. Asymptotically F distributed.

2014 Reading ANOVA

A One-Way between Subjects ANOVA was used to examine 2014 reading STAAR data. The dependent variable was the students' STAAR reading scale score and the independent variable was the program (ELLs in dual language, non-ELLs in dual language, and students receiving instruction in all English). The sample size (N), mean, and standard deviation are reflected in Table 11 for each group.

The results for Levene's test of homogeneity of variances provided a *p*-value < .05 (.030), therefore equal population variances were not assumed and the required assumption violated. The analysis was rerun using a Welch test and a Dunnett's T3 post hoc test. The Welch test indicated that there was a significant difference (p < .05) between one of the program groups which affirmed the previous result from the ANOVA, which is found in Table 12. The null hypothesis was rejected and the post hoc test was evaluated.

The STAAR scale score varied by program, $F(2, 137) = 28.296$, $p < .05$, $\eta^2 = .30$, Dunnett's T3 post hoc procedure indicated that non-ELLs in Dual Language ($M = 1615.92$, $SD = 106.83$) achieved a significantly higher scale score in reading than those who received instruction in all English ($M = 1549.66$, $SD = 119.56$) and those who

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received instruction in all English achieved a significantly higher scale score than ELLs in dual language (*M* = 1438.18, *SD* = 66.86).

Table 11

Reading 2014 Mean and Standard Deviation of Scale Scores

Program	N	Mean	Standard Deviation
ELL in Dual	33	1438.1818	66.86294
Non ELL in Dual	48	1615.9167	106.83131
All English	56	1549.6607	119.56273
Total	137	1546.0219	123.80948

Table 12

Reading 2014 Robust Test of Equality of Means

	Statistic[a]	df1	df2	Sig.
Welch	45.207	2	88.794	.000

a. Asymptotically F distributed.

2012 Math ANOVA

A One-Way between Subjects ANOVA was used to examine 2012 math STAAR data and determine if student scale scores were a function of the programs offered at the local dual language campuses (combined scores from Campus A and B). The dependent variable was the students' STAAR scale score and the independent variable was the program. The results for Levene's test of homogeneity of variances provided a p-value > .05 (.104), therefore equal population variances were assumed. The sample size (N),

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mean, and standard deviation are reflected in Table 13 for each group. The ANOVA yielded a p-value that was < .05 (.000) indicating a significant difference between one of the groups and the null hypothesis was rejected. Table 14 contains the data for the ANOVA.

The STAAR scale score varied by program, $F(2, 183) = 17.53$, $p < .05$, $\eta^2 = .16$, Tukey's post hoc procedure indicated that Non-ELLs in Dual Language ($M = 1666.74$, $SD = 107.54$) achieved a significantly higher scale score in math than ELLs in Dual Language ($M = 1546.39$, $SD = 109.75$) and those who received instruction in all English ($M = 1560.77$, $SD = 138.16$).

A One-Way between Subjects ANOVA was repeated with 2013 and 2014 data from the math STAAR test with the results presented in the following sections.

Table 13

Math 2012 Mean and Standard Deviation of Scale Scores

Program Group	N	Mean	Standard Deviation
ELL in Dual	38	1546.3947	109.74603
Non ELL in Dual	66	1666.7424	107.53537
All English	82	1560.7683	138.16123
Total	186	1595.4355	132.92924

Table 14

Analysis of Variance for 2012 Math STAAR Scores

Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	525527.428	2	262763.714	17.527	.000
Within Groups	2743456.298	183	14991.564		
Total	3268983.726	185			

2013 Math ANOVA

A One-Way between Subjects ANOVA was completed for the 2013 school year using the STAAR math scale scores. The results for Levene's test of homogeneity of variances provided a p-value > .05 (.561), therefore equal population variances were assumed. The sample size (N), mean, and standard deviation are reflected in Table 15 for each group. The ANOVA yielded a p-value that was < .05 (.000), as seen in Table 16, indicating a significant difference between one of the groups, therefore the null hypothesis was rejected.

The STAAR scale score varied by program, F (2, 158) = 11.65, p < .05, η^2 = .13, Tukey's post hoc procedure indicated that non-ELLs in Dual Language (M = 1587.86, SD = 94.67) and those who received instruction in all English (M = 1560.02, SD = 109.46) achieved a significantly higher scale score than ELLs in Dual Language (M = 1476.42, SD = 81.75). There was not a significant difference of the math scale score between non-ELLs in Dual Language and those who received instruction in all English.

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Table 15

Math 2013 Mean and Standard Deviation of Scale Scores

Program	N	Mean	Standard Deviation
ELL in Dual	24	1476.4167	81.74878
Non ELL in Dual	77	1587.8571	94.66766
All English	60	1560.0167	109.46488
Total	161	1560.8696	105.15127

Table 16

Analysis of Variance for 2013 Math STAAR Scores

Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	227300.016	2	113650.008	11.647	.000
Within Groups	1541786.245	158	9758.141		
Total	1769086.261	160			

2014 Math ANOVA

A final One-Way between Subjects ANOVA was conducted using 2014 math STAAR data. Levene's test of homogeneity of variances produced a p-value > .05 (.131), therefore equal population variances were assumed. The sample size (N), mean, and standard deviation are reflected in Table 17 for each group. The ANOVA yielded a p-value that was < .05 (.000), as reported in Table 18, indicating a significant difference between one of the groups, therefore rejecting the null hypothesis that all groups were equal.

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The 2014 STAAR scale score varied by program, $F(2, 137) = 8.81$, $p < .05$, $\eta^2 = .11$, Tukey's post hoc procedure indicated that non-ELLs in Dual Language ($M = 1638.29$, $SD = 117.73$) achieved a significantly higher scale score in math than those who received instruction in all English ($M = 1589.89$, $SD = 116.23$). In addition, ELLs in dual language ($M = 1537.77$, $SD = 81.01$) achieved a significantly lower scale score in math than those who received instruction in all English and non-ELLs in Dual Language.

Table 17

Math 2014 Mean and Standard Deviation of Scale Scores

Program	N	Mean	Standard Deviation
ELL in Dual	36	1537.7778	81.01362
Non ELL in Dual	48	1638.2917	117.73355
All English	56	1589.8929	116.22856
Total	140	1593.0857	114.83404

Table 18

Analysis of Variance for 2014 Math STAAR Scores

Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	208785.475	2	104392.738	8.806	.000
Within Groups	1624187.496	137	11855.383		
Total	1832972.971	139			

Research Question and Hypothesis 2

The second research question states: Are ELL students who participate in dual language more successful in reading and math than ELL students who participate in other bilingual models in a large North Texas school district as measured by the STAAR test? The null hypotheses ($H3_0$ and $H4_0$) for RQ2 is that there is no difference as measured by the STAAR reading and math assessment between ELLs participating in dual language and the mean of all other students in the North Texas school district who participate in other bilingual programs in the same district.

The alternative hypotheses (H3 and H4) suggest that the two groups are not equal. One-sample t-tests were conducted using assessment data to compare ELLs STAAR scores in reading and math to the district mean of ELLs who participate in other bilingual programs. Care was taken to ensure that the assumptions were met for using the one-sample t-test. The design of the study helped ensure that the observations were independent and normal distribution was tested through the use of a Shapiro-Wilk test in SPSS. For this research question, the population was normally distributed for all six tests (Pallant, 2010; Yockey, 2011).

The reading and math achievement data for 2012, 2013, and 2014 was combined on Tables 19 and 20. The tables reflect the results from the one-sample t-tests and effect size. Cohen's guidelines for effect size were used to determine a small, medium, or large magnitude of the results (Yockey, 2011). "Cohen's guidelines for small, medium, and large effect sizes for the one-sample t test are .20, .50, and .80 respectively. These values indicate the amount of difference between the sample mean and the population in terms of standard deviation units (Yockey, 2011, p. 67).

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A one-sample t-test was conducted for 2012 reading STAAR comparing ELLs in dual language and the district mean for students enrolled in other district bilingual programs. Based on the data from 2012, the researcher failed to reject the null hypothesis with no significant difference between ELLs in dual language (M = 1435.81, SD = 71.06) and the district mean of 1445.81, t (37) = -.885, p > .05. In 2013, the null hypothesis was rejected where ELLs in dual language (M = 1407.15, SD = 56.44) achieved significantly lower scale scores on reading STAAR as compared to the district mean of 1476.45, t (19) = -5.491, p < .05, d = 1.22. For the 2014 testing year, the null hypothesis was rejected where ELLs in dual language (M = 1438.18, SD = 66.86) achieved significantly lower scale scores on the reading STAAR as compared to the district mean of 1493.82, t (32) = -4.780, p < .05, d = .83. Refer to Table 19 for the compiled results from the three years of testing for STAAR reading.

One-sample t-tests were conducted for the same testing years using STAAR scale scores in math with the same students (ELLs in dual language) as compared to the district mean for students enrolled in other Bilingual programs. Based on the results the null hypothesis was rejected. ELLs in dual language (M = 1546.39, SD = 109.75) achieved a significantly higher math scale score than ELLs enrolled in other district Bilingual programs with a mean of 1508.45, t (37) = 2.13, p < .05, d = 0.35. In the 2013 testing year the null hypothesis was rejected when ELLs in dual language (M = 1476.42, SD = 81.75) achieved significantly less than the district mean of 1532.36, t (23) = -3.53, p < .05, d = .68. In 2014, based on results the researcher failed to reject the null hypothesis since there was no significant difference in math STAAR scale scores between ELLs in

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dual language (M = 1537.78, SD = 81.01) and the district mean of 1544.91, t (35) = -

.528, p > .05. Refer to Table 20 for the three years of math STAAR data.

Table 19

Reading Achievement of ELLs in Dual as Compared to ELLs in Other District Bilingual

Programs

Testing Year	Reading p-Value	Effect Size	Dual Mean	District Mean
2012	.382	No significant difference	1435.81	1445.81
2013	.000	1.22 Large Effect	1407.15	1476.45
2014	.000	.83 Large Effect	1438.18	1493.82

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Table 20

Math Achievement of ELLs in Dual as Compared to ELLs in Other District Bilingual

Programs

Testing Year	Math p-Value	Effect Size	Dual Mean	District Mean
2012	.040	.35 Small Effect	1546.39	1508.45
2013	.003	.68 Medium Effect	1476.42	1532.36
2014	.601	No significant difference	1537.78	1544.91

Research Question and Hypothesis 3

Research question three states: Are non-ELL students (language majority) who participate in dual language in a large North Texas school district more successful in reading and math than non-ELL students in the district who receive all instruction in English as measured by the STAAR test? The null hypotheses ($H5_0$ and $H6_0$) for RQ3 is that there is no difference as measured by the STAAR reading and math assessment between non-ELLs participating in dual language as compared to non-ELL students in the district who receive all instruction in English. The alternative hypotheses (H5 and H6) suggest that the two groups are not equal.

One-sample t-tests were conducted to compare non-ELLs STAAR scale scores in reading and math to the district mean for non-ELL students who receive all of their instruction in English. The design of the study helped ensure that the first of the two

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assumptions were met for using the one-sample t-test which was that observations were independent. The second assumption was normal distribution which was tested through the use of a Shapiro-Wilk test in SPSS. In the case when the population was found to be non-normal and the assumption violated, the researcher verified that the sample size met the criteria of 30 or more to prevent impact on the results of the test (Pallant, 2010; Yockey, 2011). To provide guidance on the impact of the significance, Cohen's effect size was applied and reflected in the data with .20 (small), .50 (medium), and .80 (large) (Yockey, 2011).

In 2012, non-ELLs in dual language (M = 1599.37, SD = 105.29) outperformed on reading STAAR as compared to students in the district who received all instruction in English with the district mean of 1536.20, t (66) = 4.911, p < .05, d = .60. The researcher rejected the null. For 2013, the researcher failed to reject the null with no significant difference between non-ELLs in dual language (M = 1542.46, SD = 74.28) as compared to students who received their instruction in all English, with the district mean of 1544.50, t (73) = -.236, p > .05. The researcher rejected the null hypothesis for 2014, with non-ELLs in dual language (M =1613.57, SD = 106.73) achieving significantly higher than the district students in all English, with a district mean of 1549.00, t (46) = 4.148, p < .05, d =.61.

In the same year (2012) non-ELLs in dual language (M = 1666.74, SD = 107.54) achieved higher scale scores in math as compared to students in the district who receive all of their instruction in English, with mean of 1566.80, t (65) = 7.550, p < .05, d = .93, therefore the null hypothesis was rejected. In 2013, the researcher failed to reject the null hypothesis with no significant difference between non-ELLs in dual language (M =

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1587.86, SD = 94.67) as compared to students who receive their instruction in English with the district mean of 1578.70, t (76) = .849, p > .05. Based on the data from the one-sample t-test for 2014 the researcher rejected the null hypothesis. Non-ELLs in dual language (M = 1638.29, SD = 117.73) achieved significantly higher than district students who receive their instruction in English, with the mean of 1585.30, t (47) = 3.118, p < .05, d = .45. The data for the before mentioned one-sample t-tests are summarized in Tables 21 and 22.

Table 21

Reading Achievement of Non-ELLs in Dual as Compared to District Non-ELLs in All English

Testing Year	Reading p-Value	Effect Size	Dual Mean	District Mean
2012	.000	.60 Medium Effect	1599.37	1536.20
2013	.814	No Significant Difference	1542.46	1544.50
2014	.000	.61 Medium Effect	1613.57	1549.00

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Table 22

Math Achievement of Non-ELLs in Dual as Compared to District Non-ELLs in All

English

Testing Year	Math p-Value	Effect Size	Dual Mean	District Mean
2012	.000	.93 Large Effect	1666.74	1566.80
2013	.399	No Significant Difference	1587.86	1578.70
2014	.003	.45 Small to Medium Effect	1638.29	1585.30

Conclusion

This chapter contains the quantitative results that addressed the three questions in

the causal comparative study. The first question asked if there was a statistical difference

in STAAR reading and math scale scores between ELLs in dual language, non-ELLs in

dual language, and students at the dual language campuses who receive all instruction in

English. To compare the three groups for each testing year and academic content (math

and reading) a one-way between subjects ANOVA was performed. In the case when

variances could not be assumed a Welch procedure was conducted and when appropriate

a Dunnett's T3 post hoc test was performed.

For reading in 2012 and 2014, non-ELLs achieved a significantly higher scale

score on STAAR than those students in all English and students in all English achieved a

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significantly higher scale score than ELLs. In 2013 non-ELLs and students in all English achieved a significantly higher scale score than ELLs. There was no significant difference between non-ELLs and those in all English.

For 2012 and 2014 on the math STAAR non-ELLs performed significantly higher than ELLs and those students in all English where there was no significant difference. The 2013 math STAAR data revealed that ELLs in dual language performed significantly lower than non-ELLs in dual and students in all English where there was no significant difference. Tables 23 and 24 contain the data from the six different ANOVA's for easy reference.

The second research question sought to determine if there was a statistical difference in STAAR reading and math scale scores between ELLs in dual language in comparison to the local district's mean for students who are enrolled in the district bilingual program. To address the first part of the research question, one-sample t-tests were performed for reading and math. Tables 19 and 20 contain the data for reference. In 2012, there was no significant difference between ELLs and the district mean for students in the district bilingual program. In 2013 and 2014, there was a significant difference noted, with ELLs in dual language performing lower than the district mean. Next, one-sample t-tests were performed with data from 2012 where there was a significant difference in math STAAR scale scores where ELLs in dual language performed at a higher rate than the district mean. In 2013, students in dual language (ELLs) performed significantly lower than the district mean on the math STAAR and in 2014 there was no significant difference between ELLs and the district mean.

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Table 23

Reading ANOVA Data from Research Question One

Test	Student Group	Statistical Significance	Mean STAAR Scale Score	Standard Deviation
2012 Reading $\eta^2 = .28$ Large Effect	Non-ELLs in Dual	Significantly higher than All English	1599.37	105.29
	All English	Significantly higher than ELLs in Dual	1495.81	110.09
	ELLs in Dual	Significantly lower than non-ELLs in dual and All English	1435.61	71.06
2013 Reading $\eta^2 = .23$ Large Effect	Non-ELLs in Dual	Significantly higher than ELLs in Dual	1542.46	74.28
	All English		1525.73	93.83
	ELLs in Dual	Significantly lower than Non-ELLs in dual and All English	1407.15	56.44
2014 Reading $\eta2 = .30$ Large Effect	Non-ELLs in Dual	Significantly higher than All English	1615.92	106.83
	All English	Significantly higher than ELLs in Dual	1549.66	119.56
	ELLs in Dual	Significantly lower than non-ELLs in dual and All English	1438.18	66.86

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Table 24

Math ANOVA Data from Research Question One

Test	Student Group	Statistical Significance	Mean STAAR Scale Score	Standard Deviation
2012 Math $\eta^2 = .16$ Large Effect	Non-ELLs in Dual	Significantly higher than All English and ELLs in Dual	1666.74	107.54
	All English	Significantly lower than non-ELLs in dual	1560.77	138.16
	ELLs in Dual		1546.39	109.75
2013 Math $\eta^2 = .13$ Medium Effect	Non-ELLs in Dual	Significantly higher than ELLs in Dual	1587.86	94.67
	All English		1560.02	109.46
	ELLs in Dual	Significantly lower than Non-ELLs in dual and All English	1476.42	81.75
2014 Math $\eta2 = 1.11$ Very Large Effect	Non-ELLs in Dual	Significantly higher than All English	1638.29	117.73
	All English	Significantly higher than ELLs in Dual	1589.89	116.23
	ELLs in Dual	Significantly lower than non-ELLs in dual and All English	1537.77	81.01

The third and final research question sought to compare the differences between non-ELLs in dual language with the district mean of non-ELLs who receive all of their instruction in English as measured by their scale score from the math and reading STAAR. One-sample t-tests were conducted for reading and math, and each testing year included in the study. In 2012 and 2014 non-ELLs in dual language achieved a significantly higher scale score in reading and math as compared to the district mean. In 2013, there was no significant difference between the two groups in reading or math. The data for the one-sample t-tests can be found in Tables 21 and 22.

Chapter four provided a detailed explanation of the results from this study with a short summary of the data to conclude the chapter. The following chapter will serve to synthesize the results and provide recommendations for future research that pertains to two-way dual language programs for ELLs and non-ELLs.

CHAPTER 5. DISCUSSION, IMPLICATIONS, RECOMMENDATIONS

Introduction

Year after year students who are coded limited English proficient (LEP) or English language learners (ELLs) are underperforming on high stakes tests as compared to their peers, with an even wider performance gap when compared to their white peers. The 2013-2014 Texas Academic Performance Report (TAPR) indicates at the state level that 86% of all fifth graders met the established standard on the State of Texas Assessment of Academic Readiness (STAAR) in reading as compared to 72% of ELLs who met standard. In math, 88% of all fifth grade students met the standard and 81% of ELLs met the same standard (Texas Education Agency, 2014b).

The performance gaps were more alarming when examining the reported achievement of all students represented in all grade levels during the same year. At the state level, in reading 76% of all students met standard on STAAR and 55% of ELLs met the standard. In math 78% of all students met the established standard for the year as compared to 65% of ELLs (Texas Education Agency, 2014b). The disparities at the district where the current study was conducted are reported on Table 25 (Texas Education Agency, 2014a).

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Table 25

North Texas School District STAAR Comparison: All, ELL, and White Students

Metric	Percent of All Students Who Met Standard	Percent of ELL Students who Met Standard	Percent of White Students Who Met Standard
2014 Reading Grade 5	79	71	87
2014 Math Grade 5	81	78	87
2014 Reading All Grades	65	52	74
2014 Math All Grades	66	57	73

The 2013-2014 data were similar to previous years with ELLs underperforming in comparison to their peers. The ELL student group equates to 38.2% of the local district's student population and 17.5% of the students in the state (Texas Education Agency, 2014a). This crisis calls for an evaluation of current programs and best practices as educators seek more effective ways of serving this large population.

The overarching purpose of the current quantitative, causal-comparative study was to measure the effectiveness of the two-way dual language immersion program that has been implemented in the North Texas school district since 2003 and make comparisons of the two groups of students who participate in the dual program (English

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language learners and non-English language learners), as well as the remaining students on the two campuses who receive their instruction all in English (monolingual).

The secondary purpose of the study was to make external comparisons of the two-way dual language campuses with the district averages (mean) of English language learners (ELLs) who participate in other district bilingual programs and non-English language learners (non-ELLs) who receive all instruction in English. The measurement tool was the State of Texas Assessment of Academic Readiness (STAAR) for testing years 2012, 2013, and 2014. The study closely examined the reading and math state mandated testing data for fifth graders from the two dual language campuses to determine the achievement of students.

This chapter is divided into six sections which provide summary of the study, summary of findings and interpretation of results, generalizations, limitations, implications, and recommendations.

Summary of Study

There are multiple researchers in the field of bilingual education who are recognized for their research in regard to the benefits of two-way dual language education and have presented longitudinal data that supports the premise that two-way dual language programs effectively close the academic gap of native Spanish speakers in comparison with their English speaking peers (Collier & Thomas, 2004; Lindholm-Leary, 2001; Lindholm-Leary & Block, 2010; Lindholm-Leary & Hernandez, 2011; Sanders, 2010; Thomas & Collier, 2002). The current study was conducted based on the available literature and the desire to critically evaluate the two-way dual language program that has been implemented in the North Texas school district for 12 years. With the transition in

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Texas to a new assessment instrument, there is little research regarding the effectiveness of dual language as measured by STAAR. There is also a continued need for effective programs that meet the specific needs of English language learners (ELLs) and ultimately produce higher achievement outcomes for this group of learners as well as all other students in the classrooms of today.

The following questions were addressed in the study for both reading and math. A short explanation follows each question with specifics about the statistical test that was performed and how the test was analyzed.

Research Question 1 (RQ1)

Are students who participate in dual language (ELLs and/or non-ELLs) in a large North Texas school district more successful academically in reading and math than their peers who receive all instruction in English as measured by the STAAR test?

The operational (null) hypotheses ($H1_0$ and $H2_0$) for RQ1 were that there is no difference as measured by the STAAR reading and math assessment between the three groups examined in the study:

1. English language learners (ELLs) participating in dual language,

2. Non-English language learners (non-ELLs) participating in dual language,

3. Students who receive their instruction in all English (ELLs and non-ELLs).

The alternative hypotheses (H1 and H2) suggest that there was a statistical difference in one of the three groups on the STAAR reading and math assessment.

A one-way between subjects analysis of variance (ANOVA) was used to compare the means and determine if there was a significant difference between the three groups at the two dual language campuses. Significant statistical differences were determined at a

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confidence level of .05 ($p < .05$). If a significant difference was found a Tukey post-hoc test was conducted to determine which pair-wise combination of groups was significant. The conventions for Eta-square were applied for a small (.01), medium (.06), and large (.14) effect size based on Cohen's guidelines (Yockey, 2011).

In the case where the results for Levene's test of homogeneity of variances provided a *p*-value < .05, indicating that equal population variances were not assumed and the required assumption violated, the analysis was rerun using a Welch test and a Dunnett's T3 post hoc test.

Research Question 2(RQ2)

Are ELL students who participate in dual language more successful in reading and math than ELL students who participate in other bilingual models in a large North Texas school district as measured by the STAAR test?

The operational (null) hypotheses ($H3_0$ and $H4_0$) for RQ2 is that there is no difference as measured by the STAAR reading and math assessment between ELLs participating in dual language and the mean of all other students in the north Texas school district who participate in other bilingual programs in the same district. The alternative hypotheses suggest that the two groups are not equal (H3 and H4).

A one-sample t-test was conducted to compare ELLs STAAR scores in reading and math to the district mean. If the null hypotheses ($H3_0$ and $H4_0$) were rejected the researcher calculated the effect size to determine the degree or magnitude of the result. If necessary, Cohen's guidelines were used to determine the degree of small (.20), medium (.50), or large (.80) effect size (Yockey, 2011).

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Research Question 3 (RQ3)

Are non-ELL students (language majority) who participate in dual language in a large North Texas school district more successful in reading and math than non-ELL students in the district who receive all instruction in English as measured by the STAAR test?

The operational (null) hypotheses ($H5_0$ and $H6_0$) for RQ3 is that there is no difference as measured by the STAAR reading and math assessment between non-ELLs participating in dual language as compared to non-ELL students in the district who receive all instruction in English. The alternative hypothesis (H5 and H6) suggests that the two groups are not equal. A one-sample t-test was conducted to compare non-ELLs STAAR scores in reading and math to the district mean. Therefore, if the null hypothesis in math or reading was rejected based on the result, the researcher calculated the effect size to determine the magnitude. When appropriate, Cohen's guidelines will be used to determine the degree of small, medium, or large effect size (Yockey, 2011).

Summary of Findings and Interpretation of Results

The first question asked if there was a statistical difference in STAAR reading and math scale scores between ELLs in dual language, non-ELLs in dual language, and students at the dual language campuses who receive all instruction in English. To compare the three groups for each testing year and academic content (reading and math) a one-way between subjects ANOVA was performed. In the case when variances could not be assumed a Welch procedure was conducted and when appropriate a Dunnett's T3 post hoc test was performed.

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In 2012 and 2014, non-ELLs achieved a significantly higher STAAR scale score in reading, than those students in all English. Students in all English achieved a significantly higher scale score than ELLs. In 2013 non-ELLs and students in all English achieved a significantly higher scale score than ELLs. There was no significant difference between non-ELLs and those in all English. For 2012 and 2014 on the math STAAR, non-ELLs performed significantly higher than ELLs and those students in all English where there was no significant difference. The 2013 math STAAR data revealed that ELLs in dual language performed significantly lower than non-ELLs in dual and students in all English where there was no significant difference. After examining all six ANOVA's, non-ELLs were the most successful students on the dual language campuses over ELLs and the students who receive all their instruction in English with the highest mean scale score on the reading and math STAAR test in 2012, 2013, and 2014. In 2012 and 2014 there was a statistically significant difference over ELLs and the all English group. When comparing the three student groups, it was expected by the researcher that the non-ELL group would achieve a higher result than ELLs. The results of the students in all English were helpful in understanding the impact of the dual language program at the two campuses.

The second research question sought to determine if there was a statistical difference in STAAR reading and math scale scores between ELLs in dual language in comparison to the local district's mean for students who are enrolled in the district bilingual program. One-sample t-tests were performed for reading with data from 2012. There was no significant difference between ELLs and the district mean for students in the district bilingual program. In 2013 and 2014, there was a significant difference noted,

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with ELLs in dual language performing lower than the district mean. One-sample t-tests were also performed with math data from 2012 where there was a significant difference in STAAR scale scores where ELLs in dual language performed at a higher rate than the district mean. In 2013, students in dual language (ELLs) performed significantly lower than the district mean on the math STAAR and in 2014 there was no significant difference between ELLs and the district mean. The three years of data for the second research question is inconsistent with no identifiable patterns. In addition, the ELL student group from dual language was particularly small leaving questions regarding the validity of the results (Math N= 20, reading N= 24).

The third and final research question sought to compare the differences between non-ELLs in dual language with the district mean of non-ELLs who receive all of their instruction in English as measured by their scale score from the reading and math STAAR. One-sample t-tests were conducted for each content (reading and math) and each testing year included in the study. In 2012 and 2014 non-ELLs in dual language achieved a significantly higher scale score in reading and math as compared to the district mean. In 2013, there was no significant difference between the two groups in reading or math. The 2012 and 2014 results are congruent with the research performed by Lindholm-Leary and Hernandez (2011) and Porter (2014) with non-ELLs or English dominant students outperforming their peers. The data from the current study are also aligned with Thomas and Collier's (2009) findings from their research in North Carolina. They also reported that native English speakers in dual language outperformed their counterparts in all English programs (Thomas & Collier, 2009).

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Bar graphs representing the data for each of the statistical tests performed for the current study, are located in Appendices A, B, and C.

Table 26

Detailed Composition of North Texas School District Dual Language Population

Reading	Total # in Population	# That Met Criteria for Inclusion	Percent Excluded	# ELL in Dual	# of Non-ELL in Dual	# of Students in English Only
2012	255	187	26.6%	38	67 (7*)	82 (5**)
2013	223	154	30.9%	20	74 (25*)	60 (9**)
2014	205	137	33.1%	33	48 (11*)	56 (3**)
Math						
2012	256	186	27.3%	38	67 (7*)	82 (6**)
2013	230	161	30.0%	24	77 (26*)	60 (10**)
2014	218	140	35.8%	36	48 (11*)	56 (3**)

(*) The number of 1st and 2nd year monitors included in the group that were previously coded ELL

(**) The number of 1st and 2nd year monitors included in the group that were previously coded ELL

Generalizations

The current study is considered action research and was a causal-comparative, non-experimental design. The study is also classified as ex post facto due to intentional design where the data was gathered after the fact; in this case the data was STAAR results in reading and math (McMillan, 2012). The inherent nature of the research design

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makes it impossible to generalize the results to any other setting unless the student demographics and program design are fairly similar. The ability to generalize the results are limited by the ELL group size that was a product of the monitoring system for ELLs in Texas and the small population used in the study.

Even though generalizations are limited, there is still information that can be gleaned from the study. The data from the study reflect that fifth grade students in the non-ELL student group who participate in dual language are usually more successful than students who receive their instruction in all English at the dual language campuses even though the group contained numerous students who had been previously classified as ELL. The non-ELL student group in dual language was also more successful than students in the district who receive their instruction in all English. These results were similar to Lindholm-Leary and Hernandez's data from their 2011 study where they reported that non-ELLs in dual language, which included students who had been previously classified as an ELL, outperformed their peers.

Limitations

The obvious limitations of the study are the size of the ELL student groups in dual language and the percentage of students that were excluded due to mobility. The size of the ELL student groups are a product of our system of serving students who are identified as an English language learner. Students who are coded ELL are monitored by the Language Proficiency Assessment Committee (LPAC). Specific tools and assessments are used to measure a students' English language acquisition and when specific criteria are met, the student exits limited English proficient (LEP) status and is reclassified. It is a common occurrence for students to exit LEP status by the time they enter fifth grade

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leaving a very small group of students who are ELL. The ELL group size in dual

language was small, ranging from 20-38.

For the current study, students who exited LEP status and were reclassified at the

end of their fourth grade year or earlier were included in the non-ELL group since their

LEP status changed and were no longer coded ELL through PEIMS. The number of

students who had previously been coded ELL and were included in the non-ELL group

were noted in Table 26 and were indicated in the last two columns in parentheses. As a

note, students who are no longer considered ELL are monitored for two years and are

coded first year monitor or second year monitor. This does not change the fact that these

students are no longer considered English language learners.

Table 26 also reflects the percent of students who were excluded from the

population group. The parameters of the study required that students had to have

remained enrolled at one of the two dual language campuses from the beginning of their

second grade year without a break in enrollment longer than four weeks. The mobility

rate for students in the district is reflected in the high percentages that were excluded

from the study. The percent of excluded students was as low as 26.6% in 2012 and as

high as 35.8% in 2014. The movement of students from campus to campus or from

district to district presents a limitation in that the continuity of services and instruction

cannot be controlled.

The final limitation to be noted is the stringent implementation of the 50:50 dual

language model. Since the initial implementation of the dual language model, both

campuses have had two different principals and numerous teacher changes. The teacher

turnover at any campus presents limitations with the fidelity to the model of dual

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language or any program. In the case of dual language, if teachers were not faithful to the model and program parameters there is a potential that student achievement was limited because of the deviations. After years of research, Thomas and Collier (2012) reported that a well implemented dual language program actually accelerates learning more than any other program that targeted ELLs therefore, fidelity to the model is imperative to achieve the greatest outcome for students. To ensure implementation, training and professional development were conducted in regard to dual language model as well as on-going walkthroughs to ensure proper compliance, however there is no way of ensuring 100% compliance at all times to the model.

Implications

The implication of this study and any research that is focused on more effective programs to serve English language learners is valuable. Federal, state, and local reports show that ELLs are underperforming while the size of the student group is increasing. The impetus is on educators and policy writers to find creative and sustainable solutions to meet the needs of this student group.

The data and results from the current study present specific implications for the district where the study occurred. The data reported show that students who have participated in dual language and were in the non-ELL student group by fifth grade are more successful than students across the district who participate in monolingual (English only) classrooms.

The unique feature of the current study is the use of data from the new Texas assessment instrument (STAAR). The data used in the study was from the first three years of the assessment with the initial phase-in standard for passing. The same standard

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has been set for the 2014-2015 school year with the expectation that the passing standard will increase in the following year.

Based on the success of the non-ELL student group in dual language as compared to the other students on the campus and at the district level, the researcher would encourage school leadership to consider the expansion of the dual language two-way program to other campuses that have the demographics to support a 50:50 implementation.

Upon initial examination of the results from the current study one might infer that ELLs participating in dual language are underperforming. Due to the minimal size of the ELL group, caution should be exercised when assigning weight to the mean scores. It should be noted that by the fifth grade most students who have been in bilingual education from their entry to school, exit the program and are reclassified. Therefore, leaving those left in the group representing a very small demographic who have not demonstrated fluency in English. Another factor that potentially influenced this group of students was the increased rigor of the STAAR assessment and the complexity of the language. TEA reports the following information regarding the increased complexity of STAAR as compared to the former testing instrument, the Texas Assessment of Knowledge and Skills (TAKS).

> Texts can become increasingly complex for a variety of reasons: (1) vocabulary/use of language may be more varied and challenging because it is nonliteral/figurative, abstract, or academic/technical; (2) sentence structures may be more varied, dense, and sophisticated; (3) the author's use of literary elements/devices, rhetorical strategies, organizational patterns, and text features

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may be more nuanced or sophisticated; (4) the topic/content may be less familiar or more cognitively demanding; and (5) relationships among ideas may be less explicit and require more interpretation, reasoning, and inferential thinking to understand the subtlety, nuances, and depth of ideas (Texas Education Agency, 2013a, para. 4).

Many of the skills listed are cognitive skills that are developed years into the second language acquisition process. This is the basis for a portion of the recommendations to follow.

Recommendations

The body of current knowledge focused on the benefits for ELLs participating in a two-way dual language program is vast. While this study did not demonstrate that ELLs outperform their peers, the limitations of group size must be considered when analyzing the results as well as the literature that reports numerous longitudinal studies that support the premise that ELLs in dual language outperform their peers in other programs or in English only classrooms. For the local school district it is recommended that other measures be taken to quantify the progress of all students in dual language and that students progress in both languages should be considered. It is also recommended that ELLs and non-ELLs achievement and language acquisition are measured into middle school and high school as they progress each year in the dual language program.

Based on the data from the current study, additional research is suggested that focuses on the language majority or English dominant students who participate in dual language as well as students who were previously coded through PEIMS as an ELL but were reclassified based on their level of English acquisition. These student groups were

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included in the study conducted by Thomas and Collier (2009) and Lindholm-Leary and Hernandez (2011). In the two studies, the researchers reported the results with the student groups separated as ELL or LEP students, and those who were formerly ELLs or LEP. In addition, they included the English dominant student group as a part of their research. Additional studies are recommended on a larger scale to fully understand the achievement of these groups as compared to their peers.

While the research is plentiful as to the benefits of dual language for ELLs, many of the classrooms of today contain a mix of linguistically limited students and English dominant students. Additional research on dual language immersion could be conducted that combines student groups and examines the achievement of the groups as a whole as compared to students who are not in dual language. This recommendation is based on the fact that most classrooms are a myriad of student labels and the one delineating factor is the dual language program.

As two-way dual language programs become more popular, it is recommended that more research is conducted on a larger scale so that specific student groups could be analyzed, for example, African American, Asian, White, and special education. In addition, longitudinal studies could provide additional information on student achievement into secondary education and beyond. It is also recommended that future research track cohorts of students and collect achievement, linguistic, and psycho-social data to have a full understanding of the impact of a two-way dual language program.

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District Recommendations

Based on the nature of the current action research, it is appropriate to make specific recommendations for the North Texas school district where the study was completed. Given the results of the ELL student group that was examined in this study, it is recommended that additional statistical tests be completed that include current ELLs in each testing year as well as previous ELLs who were reclassified. For the purpose of the current study, ELLs who were reclassified and being monitored were included in the non-ELL student group. Combining these two groups together and re-running the ANOVA's and one-sample t-tests would provide quantitative data regarding the achievement of all students in dual language that had been served through the Language Proficiency Assessment Committee (LPAC) process. The researcher feels this is necessary to have a complete understanding of this small student group since those who were still being served by the LPAC in fifth grade were students who had not shown English proficiency, while those who had been reclassified had met established academic and linguistic criteria.

To thoroughly evaluate the full impact of the dual language program, it is suggested that the district continue to track the current students in dual language. This collection of data should continue through middle school and into high school as students continue to receive instruction in Spanish through content specific courses. State testing data is one measurement that should continue to be collected, but it is recommended that graduation rates, advanced course participation and college completion be tracked as well.

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Two-way dual language programs require specific demographics to support English and Spanish acquisition of the limited English proficient students (LEP) and the native English speaking students (language majority). It is recommended that the two-way dual language program be expanded at the elementary level on campuses that have the demographics to support the 50:50 program.

In contrast, there are times when schools do not have the necessary population of language majority students to support a two-way program however, a one-way model should be considered. Based on the evidence presented in the literature review, the one-way dual language model is just as effective at closing the achievement gap for ELLs and is recommended for campuses in the large North Texas school district that have similar limitations.

The final recommendation is to ensure that campus leadership assigned to dual language campuses are properly trained and committed to the implementation of the model. To begin, this includes professional development regarding the parameters of the two-way model and specifics about program implementation. It will be equally important to provide teachers and staff with training and on-going support regarding language acquisition and the theory behind the model. Implementing and maintaining a dual language program requires dedication and a conviction that helping students develop fluency in two languages is worth the time and effort.

Conclusions

Based on the data presented in the current study, the researcher recommends that leadership in the local district continue to support the on-going implementation and growth of the two-way dual language program. While there were limitations and limited

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opportunity to generalize the information from the study, the data in its entirety is valuable information for making instructional decisions and recommendations for further inquiry in the district where the study was conducted.

The current research study used data from the first three years of the new assessment in the state of Texas (STAAR) making it novel to the many other dual language studies that are available. While the results are valuable in understanding the impact of the dual language program based on this one measure of student achievement, it is the hope of the researcher that other measures are used in the future to quantify the success of the students who participate.

With high stakes testing and the state and federal accountability system there is an overwhelming urge to abandon the long term goal of biliteracy for the less noble goal of achieving a passing score on a test. Language acquisition and true biliteracy takes approximately five to seven years and in many cases students in the program appear to be underperforming until approximately fourth grade (Thomas & Collier, 2002). If we are truly going to be focused on the state's goal of college and career readiness the researcher believes that the time spent on the front end is well worth the investment so that students are fully prepared to listen, speak, read, write, and collaborate in a multi-cultural world.

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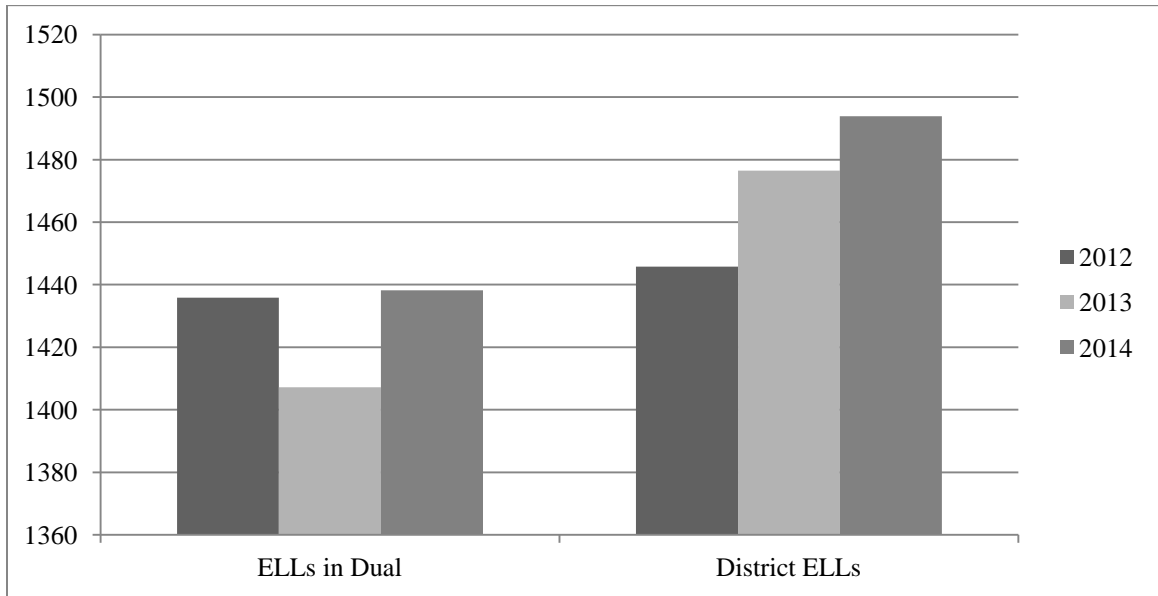**Research Question One: Bar Graphs**
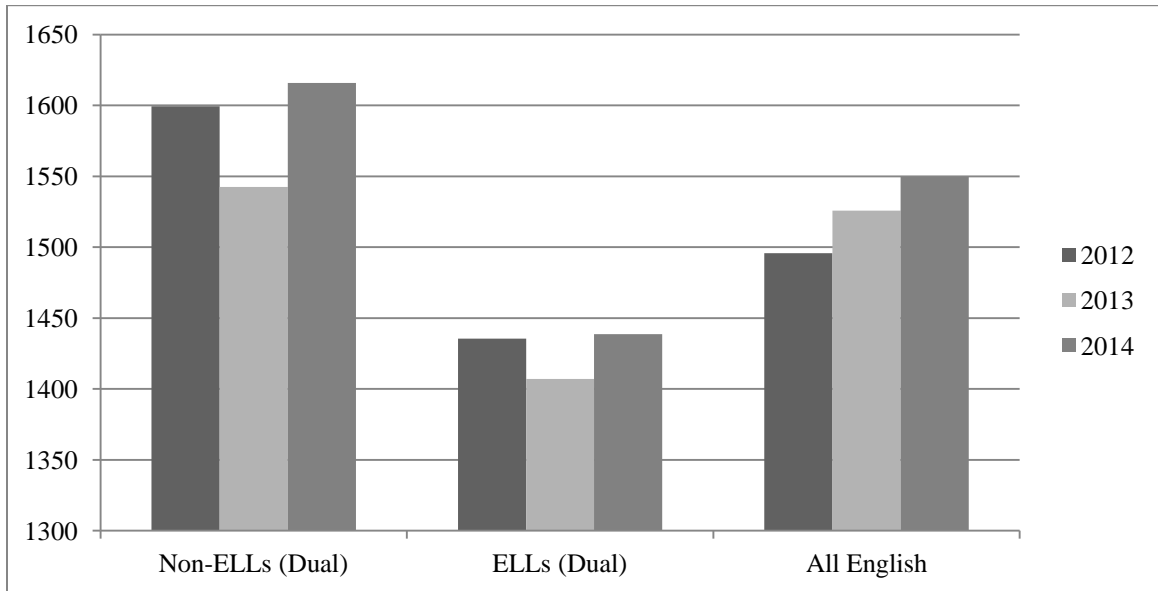
Figure A1. Bar graph representing the mean STAAR reading scale scores for ANOVA's

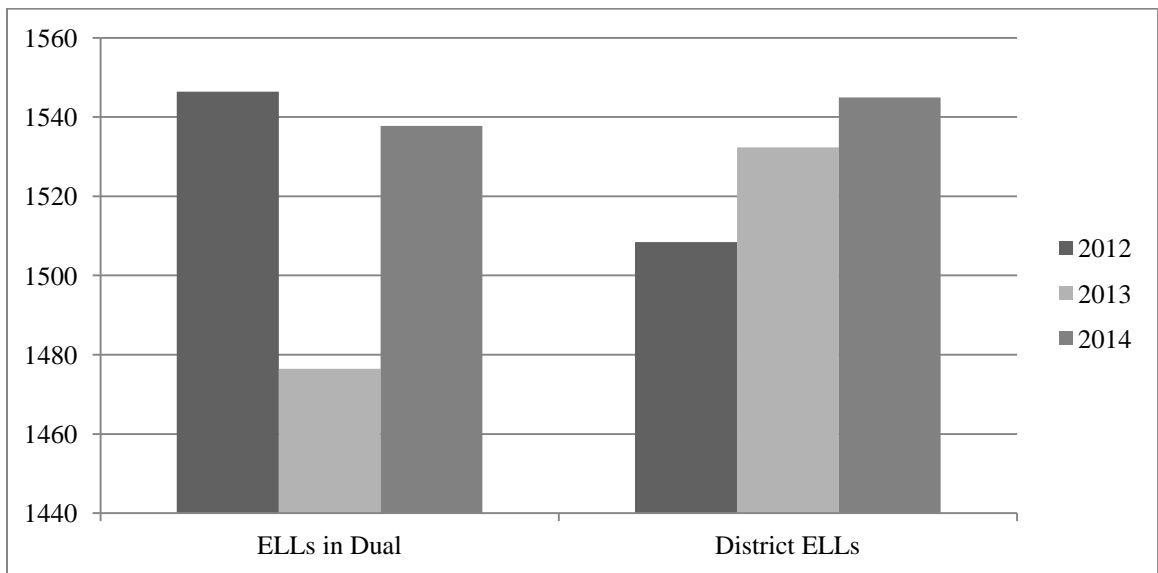conducted for research question one.
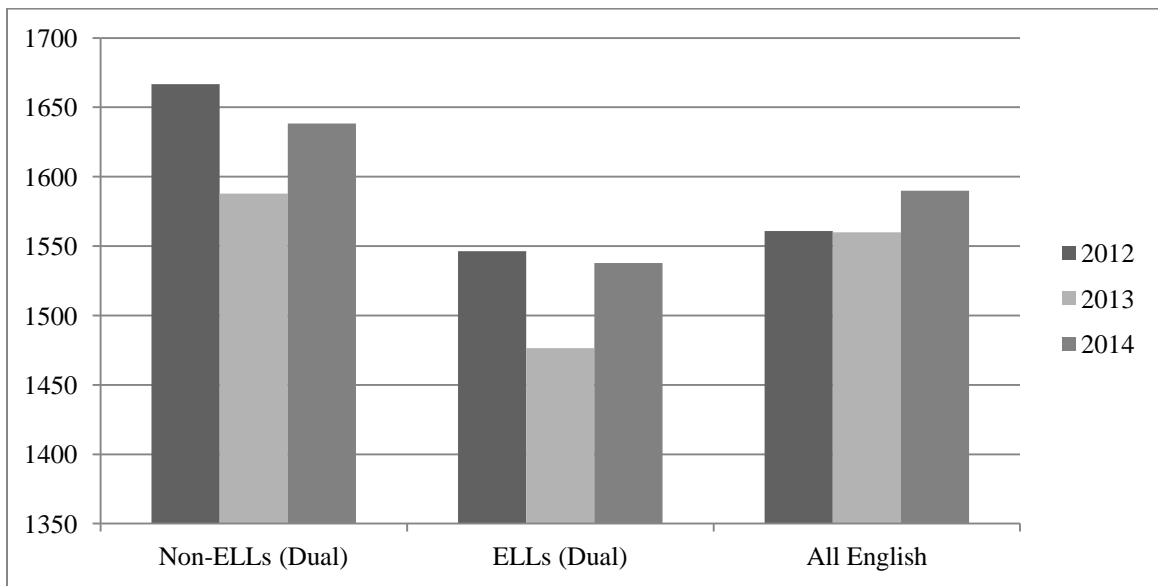
Figure A2. Bar graph representing the mean STAAR math scale scores for ANOVA's

conducted for research question one.
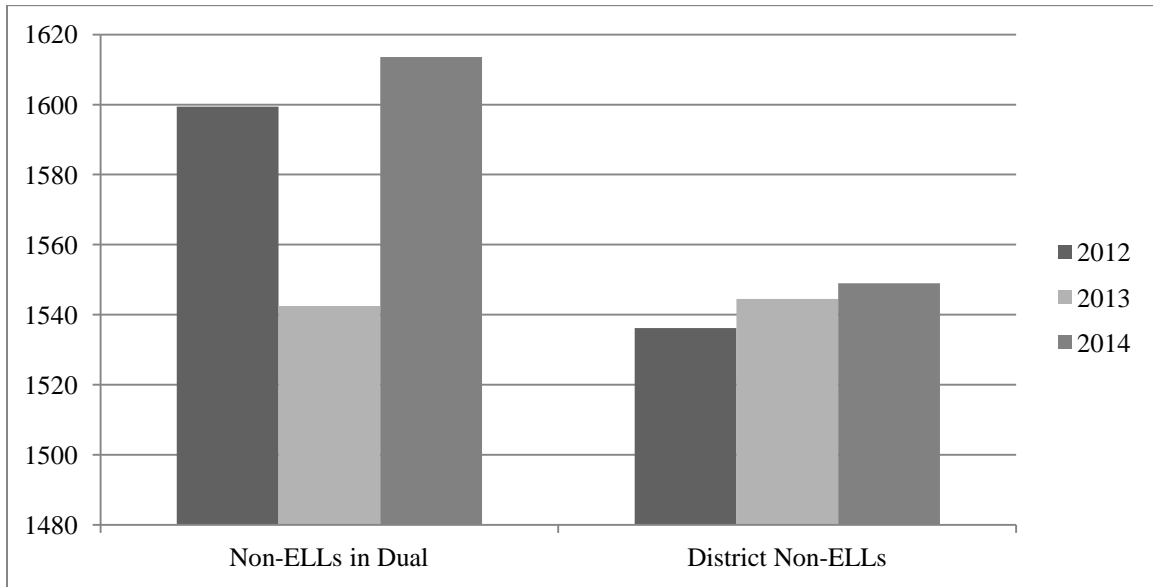
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Research Question Two: Bar Graphs

Figure B1. Bar graph representing the mean STAAR reading scale scores for one-sample

t-tests conducted for research question two.

Figure B2. Bar graph representing the mean STAAR math scale scores for one-sample t-

tests conducted for research question two.

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APPENDIX C.

Research Question Three: Bar Graphs

Figure C1. Bar graph representing the mean STAAR reading scale scores for one-sample

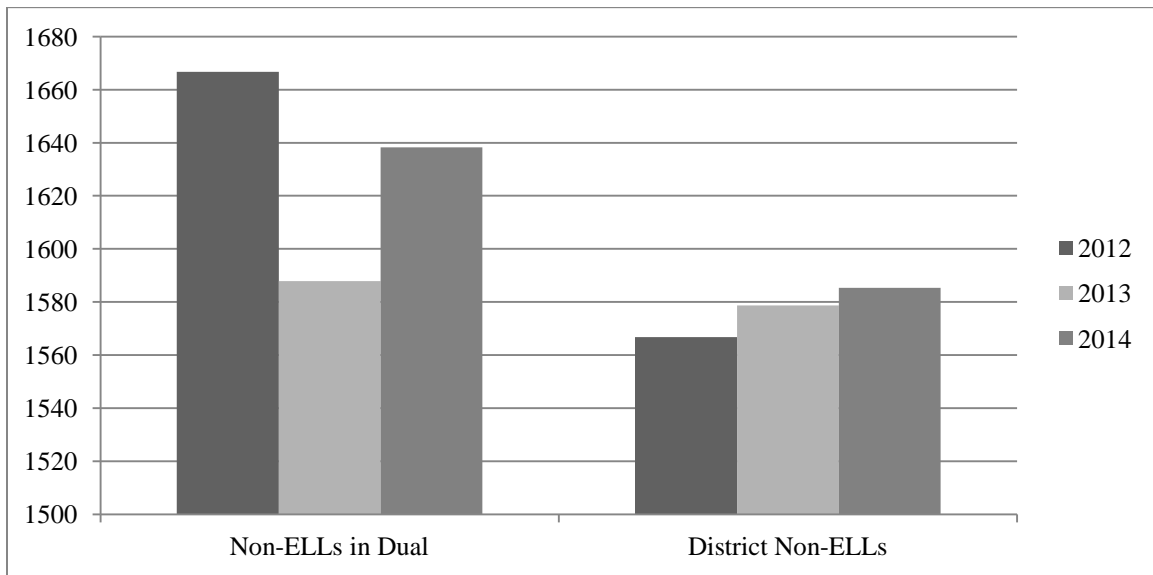t-tests conducted for research question three.

Figure C2. Bar graph representing the mean STAAR math scale scores for one-sample t-

tests conducted for research question three.