## ACCEPTANCE

This dissertation, AN EXAMINATION OF ACADEMIC EFFECTS OF AN ELEMENTARY TWO-WAY SPANISH ENGLISH DUAL IMMERSION PROGRAM BETWEEN DUAL IMMERSION STUDENTS AND NON-DUAL IMMERSION STUDENTS, was prepared under the direction of the candidate's Dissertation Committee. It is accepted by the committee members in partial fulfillment of the requirements for the degree of Doctor of Education in the School of Education, Concordia University Irvine.
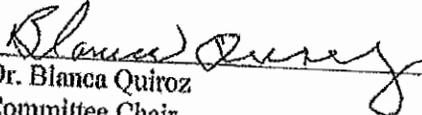
Dr. Blanca Quiroz
Committee Chair
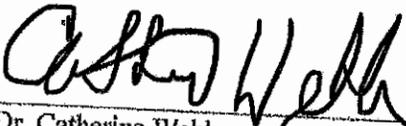
Dr. Catherine Webb
Committee Member
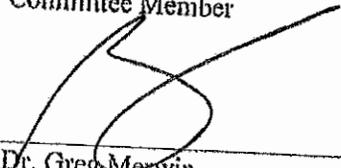
Dr. Greg Merwin
Committee Member

The Dissertation Committee, the Dean, and Executive Director of the Doctor of Education Program of the School of Education, as representatives of the faculty, certify that this dissertation has met all standards of excellence and scholarship as determined by the faculty.
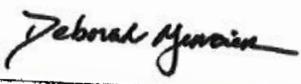
Deborah Mercier, PhD
Dean
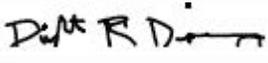
Dwight Doering, PhD
Executive Director of the Doctor of Education Program

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6526 Christine Circle
Address

Buena Park, CA 90620
City/State/Zip

Signature of Candidate

5/4/19
Date

david.appling@eagles.cui.edu
Phone Number or E-mail address

VITA

David Allen Appling, Jr.

ADDRESS   1530 Concordia West
                       Irvine, CA 92612
                       david.appling@eagles.cui.edu

EDUCATION
    EdD   2019   Concordia University, Irvine
                       Irvine, California
                       Educational Leadership
    MS   2000   National University
                       Costa Mesa, California
                       Education Administration
    BA   1989   California State University, Long Beach
                       Long Beach, California
                       Recreation and Leisure Studies

PROFESSIONAL EXPERIENCE
    2017-present   Executive Director, Human Resources
                       Magnolia School District
    2014-2017   Coordinator, Educational Services
                       Magnolia School District
    2009-2014   Principal, Canyon Rim Elementary School
                       Orange Unified School District
    2006-2009   Vice Principal, Horace Mann Elementary School
                       Anaheim City School District
                       Vice Principal, Clara Barton Elementary School
                       Anaheim City School District
    2006-2007   Adjunct Instructor, Master Courses in Curriculum and Instruction
                       Concordia University, Irvine
    2004-2006   Curriculum Specialist, Office of Curriculum and Instruction
                       Anaheim City School District
                       Curriculum Specialist, Office of School Improvement
                       Anaheim City School District
    2000-2004   Resource Teacher, Patrick Henry Elementary School
                       Anaheim City School District
                       Resource Teacher, James Madison Elementary School
                       Anaheim City School District
    1996 - 2000   Classroom Teacher, Palm Lane Elementary School
                       Classroom Teacher, Betsy Ross Elementary School
                       Anaheim City School District

AN EXAMINATION OF ACADEMIC EFFECTS OF AN ELEMENTARY TWO-WAY
SPANISH-ENGLISH DUAL IMMERSION PROGRAM BETWEEN DUAL IMMERSION
STUDENTS AND NON-DUAL IMMERSION STUDENTS

by

David A. Appling, Jr.

A Dissertation

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School of Education
Concordia University Irvine

ABSTRACT

This study compares the academic achievement and language acquisition performance of dual immersion students presently attending the Two-Way Spanish-English Dual Immersion program and non-dual immersion students that are attending the same school in a monolingual classroom. The study builds on prior studies regarding dual immersion programs and their academic effects on student achievement. The performance of students in kindergarten through grade five who participate in the Two-Way Spanish-English Dual Immersion Program in District XYZ are compared to those students who attend the same school but do not participate in the Two-Way Spanish-English Dual Immersion Program. Both sets of students have completed all years of their schooling at the same school to give validity to the study. The use of common state and district assessments has been used to provide quantitative data that can be analyzed using reliable statistical measures to determine the effects of the Two-Way Spanish-English Dual Immersion Program against the students who participate in the general monolingual classroom receiving instruction in English only. Surveys administered to students, parents, and teachers will contribute to the qualitative portion of the study. The qualitative data provide personal knowledge and perspectives of the Two-Way Spanish-English Dual Immersion program.

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ACKNOWLEDGMENTS

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Through my many years in education, there have been some incredible mentors that shared and provided guidance, encouragement, and experience that led me to the educator and advocate of education I am today. In particular, there is a special someone that guided me into the world of education. I met her in high school as my guidance counselor; she then became a mentor through my college years and then became one of my closest friends as we continue down this spiritual path of life. I will be forever grateful for her belief in me – you are my light.

There are no words that can describe the amount of unconditional love that I have for my mother and father. They have always been my biggest supporters in going after my dreams and never giving up – I hope I have made you proud! I want to extend my gratitude to my family and friends who have lent their kind words of encouragement as I progressed through this journey.

Most of all this is dedicated to my inspirational husband who supported me each and every day on this journey. He gave me the strength to get up and persevere through the challenges and appreciate the milestones along the way. This great accomplishment and triumph could never have happened without the love and support of you – thank you.

CHAPTER 1

Background of the Study

Educational researchers have long been interested in identifying and understanding the academic effects on student achievement among students who participate in dual immersion programs versus students who receive instruction in a monolingual educational setting. For the past several decades, research demonstrates that students who participate in a dual immersion program meet and then exceed their peers around the fifth-grade level. Lindholm-Leary (2007) states from her research, "By fifth or sixth grade, almost all ELL students who had attended a two-way immersion program since kindergarten or first grade were rated as proficient in both languages."

The brain strengthens when learning two languages allowing it to learn other subject matter with a higher retention rate (Hernandez, 2013). According to Hernandez (2013), "As the structure gets built, there is less flexibility in the brain for late learned inputs to influence it." Thus, the early years and early acquisition of two languages in elementary school is a critical foundation for becoming bilingual and bi-literate. The nature of bilingual processing and the neural bases of the bilingual brain are the foundation for early learning of a second language. The brain is said to develop its parts in different periods of time with four lobes, three of which are involved in sensory processing. In the back of the brain, there is the occipital lobe, which enables visual processing. Beneath the ears, there is the temporal lobe, devoted to sound processing. In the upper middle portion of the brain, there is the parietal lobe, which is interconnected with other sensory areas of the brain and it serves as a transfer point for the streams of information that bombard our senses (Hernandez, 2013). This scientific discipline

investigates the neural mechanisms in the human brain that control the comprehension, production, and acquisition of languages.

One of the most predominant factors contributing to the diversity of California public schools and classrooms is the language that children speak. Many students currently entering school speak a language other than English and are identified as English learners (ELs). In 2015-2016, it was reported by the California Department of Education that 1.4 million English learners are in the California public school system, which constitutes 22.1% of the total enrollment in California public schools.

Table 1

English Learners for Fall 2017.

Language	Percent
Spanish	82.19%
Vietnamese	2.17%
Mandarin (Putonghua)	1.78%
Arabic	1.5%
Filipino (Pilipino or Tagalog)	1.27%
Cantonese	1.2%
Korean	0.79%
Hmong	0.74%
Punjabi	0.72%
Russian	0.69%

Note. Reprinted from "Facts about English Learners in California – CalEdFacts" by the California Department of Education, 2016, Copyright 2018 by the California Department of Education. Retrieved from http://www.cde.ca.gov/ds/sd/cb/cefelfacts.asp

In 2016-2017, it was reported by the California Department of Education that 1.3 million English learners are in the California public school system, which constitutes 20.4% of the total enrollment in California public schools overall, decreasing from the previous year. Currently from the data gathered, 71.5% of English learners are enrolled in elementary schools and 94% of these children speak one of the top ten languages in the state of California (see Table 1).

Two-way dual language programs are designed for two groups of students to learn together in a systematic way so that both groups become bilingual and bi-literate in the two languages. Stephen Krashen (1999) and Jim Cummins (1996) are two language researchers who heavily influenced the growth of bilingual and dual language programs. Both authors asserted and confirmed in their research that, given time, the stronger language-minority students become in their native language, the more proficient they become in their new language. Collier & Thomas (2004), two other noted long-term researchers in this field, describe a two-way program as an enrichment model that is transformative for teachers, parents, administrators, and communities. Their study intended to verify the academic achievement effects of dual immersion students and non-dual immersion students.

Many policymakers and educators attempt to close the achievement gap by implementing various forms of bilingual programs for English learners, such as the Alternative Bilingual Education (ABE) and the Two-Way Bilingual Immersion (TWBI). Each program differs in its approach, methods, and results. Without quality instruction that addresses the specific linguistic and academic needs of English learners, significant numbers of students may be unable to meet the standards set by the national mandate of Every Student Succeeds Act (2015), formerly known as No Child Left Behind (2001).

Two-Way Dual Immersion programs are used increasingly in California's public schools. The 90:10 and 50:50 Two-Way Dual Immersion programs are used most frequently. Many studies show both the 90:10 model and the 50:50 model increase student knowledge and academic fluency (Lindholm-Leary, 2001). Included in the models of Two-Way Dual Immersion Programs are both a 50:50 model and a 90:10 model. Students in a 50:50 model receive instruction in equal amounts for both languages (Howard, Sugarman, & Christian, 2003). The distribution of language instruction varies and can include transition by day, week, and half day (Gomez, Freeman, & Freeman, 2005). As per Garcia and Jensen (2006), "Programs vary in terms of the amount of time they devote to each language, which grade levels they serve, how much structure they impose for the division of language and curriculum, and the populations which they serve" (p. 2). In the 90:10 model, students begin the program in kindergarten with 90% of the instruction in the target language with increasing levels of English throughout the grade levels until equality in the use of both languages is reached (Howard et al, 2003).

Dual Immersion programs make the content of language learning concrete because students are learning a language in the context of school with social and cognitive support from teachers and peers who are native speakers of the language they are learning. Students participating in these programs show so much growth that they begin to surpass their peers in the general education populations. Included in the models of Two-Way Dual Immersion Programs are both a 50:50 model and a 90:10 model.

Barnett shares that most two-way dual language immersion programs combine the grouped students with English- and Spanish-speaking students. As guided by the California Department of Education (2016), "The ideal ratio of English learners to English speakers is 50:50, but to stay within the program design, the recommendation of many practitioners is that

the ratio should never go below 33% for either language group". The language taught changes from class to class, week to week, or even teacher to teacher (Barnett, Yarosz, Thomas, & Blanco, 2007).

Dual Immersion programs make it more equitable because instruction validates the knowledge that Spanish speakers bring from home, and also makes bilingual instruction available to English speakers, who might not otherwise have opportunities to learn a second language. This study examines the effects of bilingual instruction in a Two-Way Bilingual Immersion program on the academic achievement of Hispanic English learners as measured by standardized state tests. The academic performance of the treatment group is compared against similar students who participate in classrooms where instruction is solely in English.

Statement of the Problem

The number of Spanish-speaking learners in California, although showing a slight decrease, remains significant at over 20%. These Spanish-speaking learners are handicapped as they attempt to learn in a language in which they are not proficient. Spanish speaking learners are also losing the opportunity to become bilingual, which is a skill that will help them accelerate their learning. This study analyzes and compares the academic effects of an elementary Two-Way Spanish-English Dual Immersion program (Dual Immersion students versus Non-Dual Immersion students). The significant enrollment of Hispanic students in California's public schools, combined with children speaking their native language, Spanish, at home, has resulted in the increase of alternative instructional approaches, such as dual language immersion programs. Most often, the language of instruction is driven by the subject matter being taught (Garcia & Jensen, 2006; Howard et al., 2003).

Fullan and Quinn, in the book *Coherence,* discuss the need for improving schools and suggest successful strategies for implementing school reform. According to Fullan and Quinn (2012), successful change agents in schools share the common belief that all children can learn. Fullan and Quinn (2012) also emphasize the need to review available data, share one vision, create one plan, align curriculum and standards, employ staff collaboration, engage in professional development that is specific to identified student achievement needs, and continuously review and rethink their current practices. As Fullan and Quinn (2012) express, "Collective capacity building involves the increased ability of educators at all levels of the system to make the instructional changes required to raise the bar and close the gap for all students" (p. 57). The authors uncover elements that are critical to continuous school improvement, beginning with understanding where your organization is currently, how you arrived at this point, describing where you want to be within a given timeframe, and identifying steps you will take to achieve the desired results.

Appropriate data analysis procedures must be used to determine overall program effectiveness. Data analysis procedures vary when developing survey instruments, which provide quantitative information, and collecting and analyzing student achievement data, which provide quantitative information.

Purpose of Study

The population within America's public-school system is changing (Planty, Hussar, & Snyder, 2009). Two-Way Spanish-English Dual Immersion programs are increasing in number due to the dynamics of the growing population of native Spanish-speaking students in America's public schools. This study will be conducted at a publicschool, serving students in a dual immersion program. Students in the dual immersion program will be compared to other

students, at the same school, that are not attending the dual immersion program yet have been enrolled at the school since kindergarten.

There are two main purposes for this research study. The first purpose of this comparative study is to analyze if students in a Two-Way Spanish-English Dual Immersion Program perform higher overall than students in the general education English only classrooms at School A. The second purpose of this evaluation study is to analyze student, parent, and teacher surveys that present individual perspectives on the success of the Two-Way Spanish-English Dual Immersion program. The comparison results will add to the past and current research being conducted on dual immersion programs and their academic effects (see Figure 1).
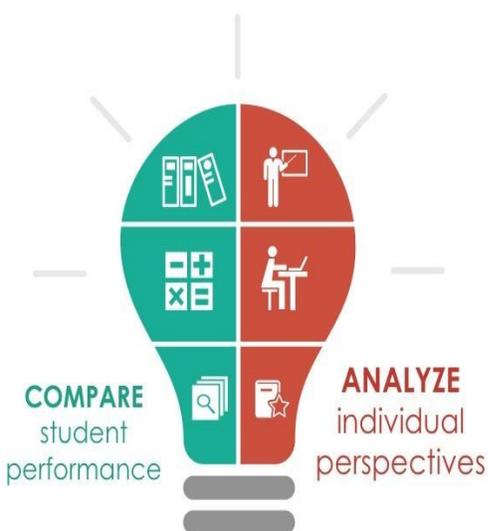
Figure 1. Data comparison process.

At this stage in the research, the student academic performances will be defined by district and state assessments, as well as with student, parent, and teacher surveys. The student academic performances will be analyzed alongside peer academic performances to determine the success of student achievement outcomes. This study was designed to build upon the existing body of research, and it specifically evaluates the current bilingual program being implemented

in District XYZ. Similarities and differences in the perspectives of these key dual immersion researchers in the educational field have been studied.

Dual Immersion programs prepare learners to contribute to global citizenship and to succeed in international business. This preparation occurs by increasing student skills and knowledge in general education subjects while strengthening skills in the students' native language and their acquired new language. Students are thus expected to have increased advantages for employment in major corporations that deal with other companies domestically and internationally.

Research in bilingual education has identified that bilingual programs are the most beneficial in the maintenance of the home language, the development of English for English learners, and for learning academic content (Lindholm-Leary, 2001). District XYZ, which has a 53% English language learner population, is now in its sixth year of dual immersion implementation. The Two-Way Spanish-English Dual Immersion program is one of the district's most widely used strategies to increase EL student engagement and achievement levels.

English language learner students within District XYZ that attend the Two-Way Spanish-English Dual Immersion program have a higher potential to excel and surpass in academics. These students have lower drop-out rates and have a higher rate of college attendance than other students in the general education classrooms. Through this evaluative study, District XYZ has the opportunity to compare its student data to the data of other researchers and school districts. The data obtained in this study has the potential to validate the success of the program and can be used to expand the adoption of the Two-Way Dual Immersion program at other similar schools within District XYZ. District XYZ Board members will be able to review statistical evidence

that attests to the achievements and successes of the students that participate in the Two-Way Spanish-English Dual Immersion program.

The argument for creating a Two-Way Spanish-English Dual Immersion program that supports student learning at the elementary school level is to increase student achievement and language proficiency. The researcher's central focus was on the effects of an elementary Two-Way Spanish-English Dual Immersion program on student achievement within a 90:10 model.

Early in the research process, the researcher first reviewed several studies to identify the successful components of Two-Way Spanish-English Dual Immersion programs. The researcher was specifically interested in identifying bilingual program elements that contribute most significantly to English learner preserving existing knowledge levels and expanding subject matter content levels across core subjects.

Second, the researcher reviewed the students' demographic information of those attending current models of two-way dual immersion programs. The study compared district and state assessment data of those in the Two-Way Spanish-English Dual Immersion program to the students attending the same school in the general education population.

Finally, the mixed methods approach will explore and analyze the success of the bilingual program implementation. As concluded by Carrera-Carillo and Smith (2006), "The most effective model for instruction was dual language education (p. ix)." There are seven research-based elements that have been proven to be effective: planning, classroom organization, and strategy practices in teaching, activities, accountability, and building community (Carrera-Carillo & Smith, 2006). These seven steps result in the highest student academic performance in dual immersion programs.

Over the past decades, there have been many culture wars advocating for "English first" education. California passed Proposition 227 in the hope to sharply reduce the amount of time that English language learners spent in bilingual educational settings. With decades of two-way dual language immersion research and the repeal of Proposition 227 through the passage of Proposition 58, California bilingual programs are becoming more prevalent across the state. As per Sanchez (2016), "Bilingual classes in which kids are taught in their native language gradually make the transition to English" (p. 1). This largely reversed decision in California paved the way for the expansion of bilingual education and dual immersion programs, which support the state's ever-growing population of English language learners. Expressed by Barac and Bialystok (2010), "The outcome of the experience is, in fact, the opposite of what many early researchers claimed and what many contemporary parents intuitively believe. In contrast to early warnings about negative consequences, bilingualism turns out to be an experience that benefits many aspects of children's development" (p. 36).

With low socio-economically disadvantaged students and second language learners come many inequities in our public education systems. There are many studies showing that both the 90:10 model and the 50:50 model increase student knowledge and academic fluency (Lindholm-Leary, 2001). Stephen Krashen (1999) and Jim Cummins (1996) are two language researchers who heavily influenced the growth of bilingual and dual language programs. Both researchers have asserted and confirmed in their research that, given time, the stronger language-minority students become in their native language, the more proficient they become in their new language.

In my study, I will compare and analyze the two matched samples of students. All of the students have been at the same school since kindergarten and exposed to the same curriculum, strategies, interventions, and instructional pedagogy. Both matched sample groups have similar

demographics and come from similar backgrounds. The difference that will be analyzed is that one group has participated in the dual immersion program while the other group has received instruction in a monolingual mainstream classroom. This study will compare quantitative data from district and state assessments and analyze perspectives of dual immersion from the students, parents, and teachers here.

Research Questions

This research study will examine the biliteracy development and maintenance of the home language, the development of English for English learners, and acquisition of academic content. The following questions will be addressed in the dissertation:

1. What are the performance scores in language arts and mathematics standardized tests of students in a Two-Way Bilingual Immersion instruction? (Quantitative)

2. In what ways do the scores on standardized tests with students in a Two-Way Bilingual Immersion program compare to monolingual English-speaking students in an English Language Mainstream program? (Quantitative)

3. How do students, parents, and teachers interpret their experience in the dual immersion program? (Qualitative)

This study is relevant to theory and practice because assessment results for students from a Two-Way Spanish-English Dual Immersion program environment were compared to assessment results for students participating in a monolingual English program. Results contribute to the existing body of knowledge regarding effective strategies for English learners.

Limitations

This study will be limited to a total of 84 students who participated in the treatment group. The first set of 41 students, 21 English learners and 20 non-English learners, have been

attending the Two-Way Spanish-English Dual Immersion program since Kindergarten for a total of six years. Their performance was compared to a control group of 43 selected students, 17 English learners and 26 non-English learners, who did not participate in the Two-Way Spanish-English Dual Immersion program, yet have attended the same school with the same teacher instructional backgrounds and experiences, curriculum, interventions, and instructional strategies as the experimental group of students. The study was limited to 41 students in the program and 43 students outside of the program due to mobility and transiency rates of families. Data gathered from assessments and surveys was used to formulate the findings within the study.

Delimitations

The delimitations utilized by the researcher in this study were determined by a desire to better gain an understanding of dual immersion programs and the academic effects of student achievement within these programs. To gain a better perspective of the program, the researcher used a control group of students with matched experiences. The researcher had access to students who are English speakers, English learners, low socio-economically disadvantaged, of similar demographics, enrolled at the same school since kindergarten, and instructed by teachers using the same materials, strategies, interventions and professional development.

District XYZ has developed and implemented programs over the years to support the continuous increase in the English learner population. The Two-Way Spanish-English Dual Immersion program has proven to be successful in helping students attain language proficiency, acquire academic content, and be successful. The Two-Way Spanish-English Dual Immersion program has also been successful in helping the district meet District goals and attain the vision of student success it has for students, especially English learners. Over the past six years, the Two-Way Spanish-English Dual Immersion program in District XYZ has grown from 48

students to 393 participating students from kindergarten through sixth grade. This is an increase of almost seven times the number of enrollments as compared to when the program began. For purposes of this study, gender, ability levels, socioeconomic status, were not taken into consideration. In the Two-Way Spanish-English Dual Immersion program, teacher qualifications and experience are similar to the teachers instructing at the same school in the English only classroom.

Assumptions

It is assumed that the student, parent, and teacher participants will honestly express their views in surveys. It is also assumed that bilingual students, whether learning English or Spanish, are all provided similar structures by teachers using the same materials, strategies, interventions and professional development.

Theoretical Framework

One component of this comparison study is to analyze the effects of social interaction on language acquisition. Christian, Montone, Lindholm, and Carranza (1997) reported, "Meaningful linguistic input is transmitted to the child during interaction with more experienced speakers and similar processes appear to be involved in the acquisition of a second language." Dual Immersion programs are designed so that both the English speaker and the English learner student groups can model the language for one another. This built-in component supports all learners within the Dual Immersion program, giving them multiple opportunities to interact.
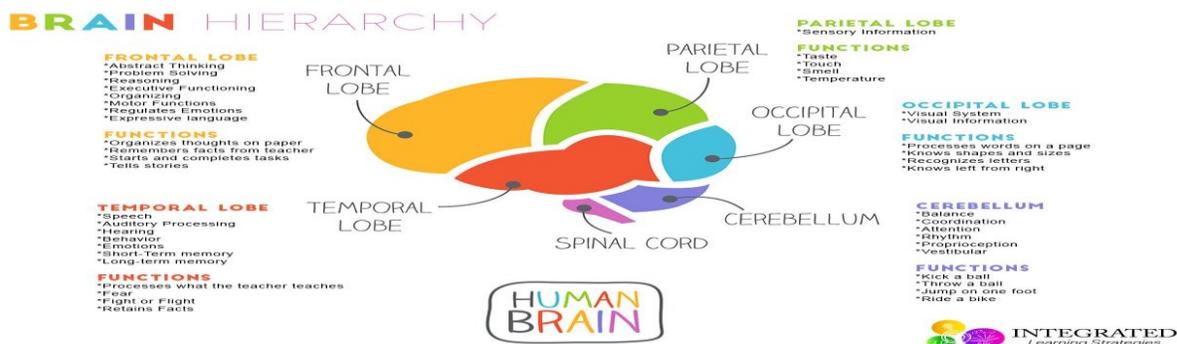
Figure 2. Integrated learning strategies and brain hierarchy.

Cognitive learning of language and brain development occurs concurrently at an early age (see Figure 2). The brain develops in periods and within the four lobes, three of which are involved in sensory processing. First, in the back part of the brain, there is the occipital lobe, which enables visual processing. Next, beneath the ears, there is the temporal lobe, devoted to sound processing. Then, in the upper middle portion of the brain, there is the parietal lobe, which is interconnected with other sensory areas of the brain. The parietal lobe serves as a transfer point for the streams of information that bombard our senses (Hernandez, 2013). The instructional practices in this study support brain strengthening and how they enable the brain to retain more.

There are several theoretical assumptions and rationale about content learning and language learning dealing with conceptual, flexibility, and depth of learning within dual immersion approaches and programs. Content knowledge acquired through one language paves the way for knowledge acquisition in the second language (Collier, 1992; Krashen, 1991). Krashen (1991) further states, "When native language instruction is provided for language minority students with appropriate second language instruction, students can achieve academically at higher levels in the second language than if they had been taught in the second language only" (p. 7).

For the past several decades, Lindholm-Leary has been researching two-way immersion programs and the academic effects they have on students. Lindholm-Leary has worked with state departments of education, school districts, professional organizations, and community agencies. She has been an author of many comparative studies, books, and articles surrounding English learners and dual language programs. At the heart of the studies of Howard, Sugarman, and Christian (2003) in the reference book, *Guiding Principles for Dual Language Education*, is decades of the passionate work of Lindholm-Leary. The principles displayed help frame the body of this study. Most recent studies conducted by Lindholm-Leary (2009) clearly illustrates that fifth-grade students in a dual immersion program outperform general education students in an English only classroom at the school level, district level, and state level (see Figure 3).
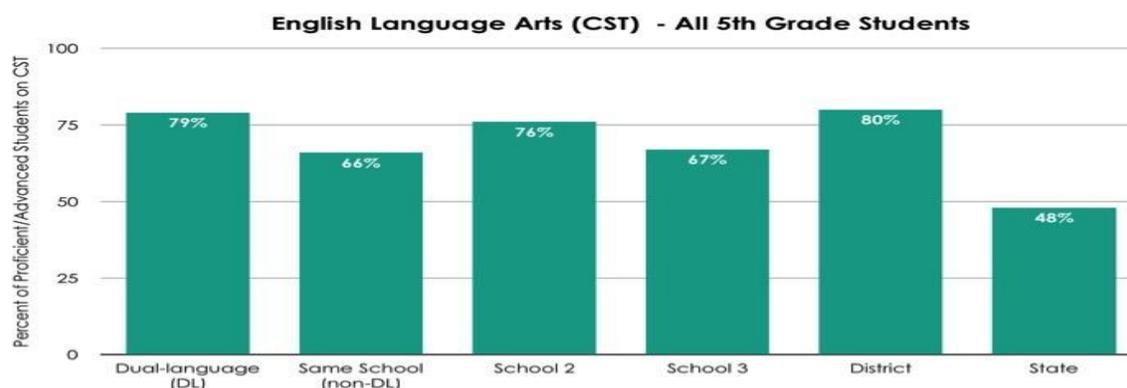
Figure 3. Proficiency of students in English Language Arts Dual-Language programs as compared to general education students. Adapted from "10 things you should know about current dual language", by K.J. Lindholm-Leary, 2009, University of Oregon Conference on Biliteracy. Retrieved from http://www.lindholm-leary.com/present&handout/UnivOR2009_plenary_10ThingsResearch_4web.pdf.

The theoretical framework for this research is based on an organized body of interrelated concepts, assumptions, and generalizations that support students participating in a Two-Way

Spanish-English Dual Immersion program. It is also founded on the theory that students,

especially second language learners, outperform their normed peers in academics when

participating in a dual immersion program. Lindholm-Leary (2009) proves through case studies

that English learners participating in a dual immersion program and English proficient students

participating in a dual immersion program continue to increase their academic abilities (see

Figure 4). Two-Way Spanish-English Dual Immersion programs are increasing in number due to

the dynamics of the growing population of native Spanish-speaking students in America's public

schools.
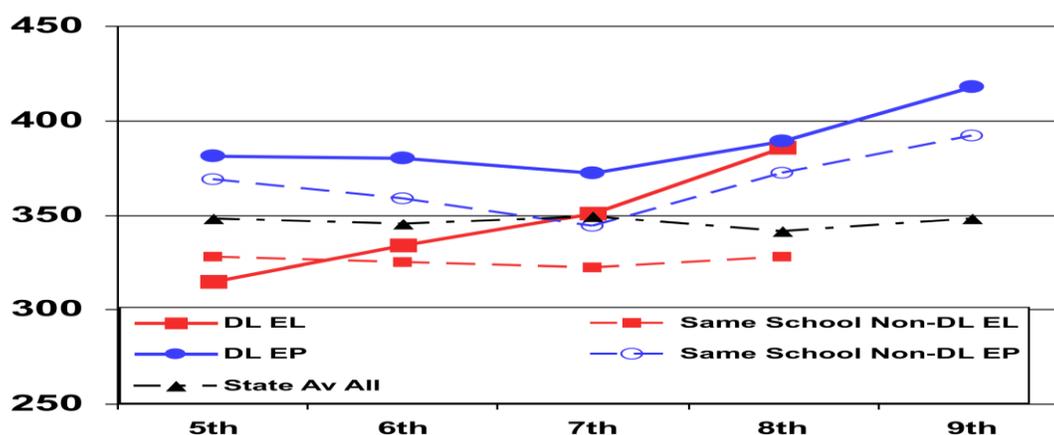
 Figure 4. Proficiency of students in English Language Arts Dual-Language programs as
compared to general education students. Adapted from "10 things you should know about
current dual language", by K.J. Lindholm-Leary, 2009, University of Oregon Conference on
Biliteracy. Retrieved from http://www.lindholm-leary.com.

This study analyzes the current practices in the dual immersion programs and decades of

research to demonstrate that students outperform their peers who do not participate in a dual

immersion program. This study analyzes through an intensity sampling of control groups of

students and qualitative data relevant to students participating in dual immersion programs

compared to other general education students that are not participating in dual immersion

programs. Analysis of co-variance and causal-comparative research will be reviewed providing evidence of student success as they perform in a dual immersion instructional model.

Significance of the Study

This study gives the opportunity to review and assess student performance from year one through year six of their elementary education, to determine the effects of a Two-Way Spanish-English Dual Immersion program on student achievement levels. Positive effects of bilingual education have been shown for over 20 years (Lindholm & Fairchild, 1988; Medrano, 1988). Cazabon, Lambert, and Hall (1993) state that language transfer does occur. Their findings are based on the language arts and mathematics test scores of bilingual learners, which showed greater increases in conceptual and computational knowledge than the monolingual control groups. The significance of this study is essential as it contributes valuable input and data into the successful implementation of dual immersion programs that result in high student achievement that aligns with past decades of dual immersion program success rates (see Figure 5). This study is also significant as an influencing factor in the Board of Education's decision to adopt the Two-Way Spanish-English Dual Immersion program. Results of this study may be used to validate prior research work in this field. Results may also be used to expand the program to other schools within District XYZ. Reyes (2014) reports, "The results of the independent t-test showed a significant difference in the CST English language arts mean scores between English learners who participated in the dual language program and English learners who participated in a mainstream English program. The results of the analysis favored the group of English learners who participated in the dual language program."
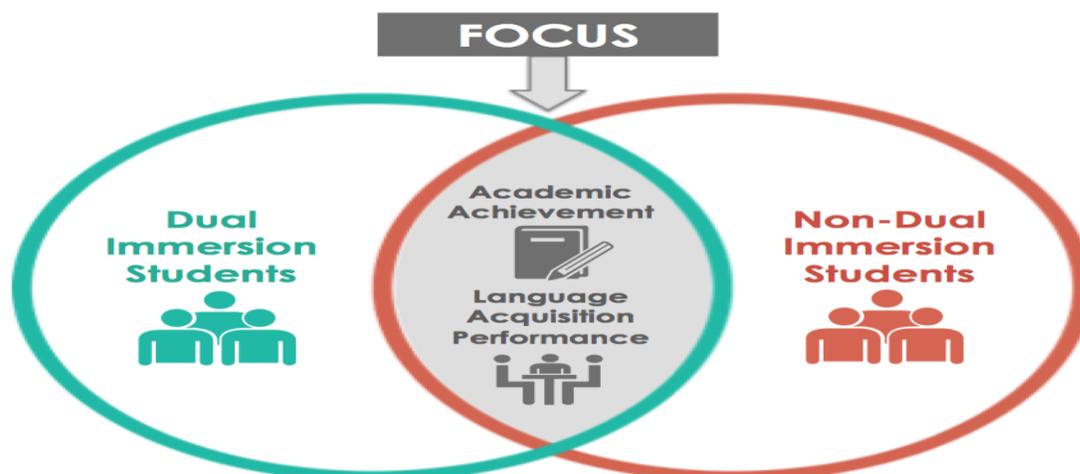
Figure 5. Focus on academic achievement and language acquisition.

In regards to dual language programs and shared by Carrera-Carillo and Smith (2006), "The goals of the school are to develop social and academic competence in two or more languages; provide instruction that emphasizes high academic performance in all core subjects; and offer students ample opportunities to experience a variety of cultural studies through academics and the arts" (p. 77).

Operational Definition of Terms

Student Survey: This survey will measure, demonstrate, and provide the student perspective of participating in the dual immersion program.

Parent Survey: This survey will measure, demonstrate, and provide the parent perspective of having their child participate in the dual immersion program.

Teacher Survey: This survey will measure, demonstrate, and provide the teacher perspective of teaching students in the dual immersion program.

Student Achievement: It is defined as the results earned by each student for their state and district assessments such as the California Assessment of Student Performance and Progress (CAASPP), English Language Proficiency Assessments for California (ELPAC), Language

Assessment Scales (Las Links), District English Language Arts and Mathematics Interim

Assessments, and District English Language Arts and Mathematics Unit Tests.

English Learner (EL): A student that has not developed his listening, speaking, reading,

and writing proficiencies in English appropriately to participate in the academics of a regular

school sufficiently. Students transition from English learners to what is referred to as Limited

English Proficient (LEP) as they have mastered certain skills. This reclassification from EL to

LEP signifies that the students are linguistically competent in the English language to participate

in the English-driven general education curriculum. The assessment for reclassification is the

California English Language Development Test (CELDT), which is currently changing to the

English Language Proficiency Assessments for California (ELPAC).

L1 Literacy: Language transfer referring to speakers or writers applying knowledge from

one language to another language; the first or native language.

L2 Literacy: Language proficiency level of another language in addition to your native

language; second language learner.

Structured English Immersion (SEI): It is a program defined and established where

English learners are not acquiring reasonable fluency in English, as defined by the school

district, and are provided instruction through an English language acquisition process and

program. This type of process and program collectively is having all classroom instruction

delivered in English but with a curriculum and instructional delivery designed for students who

are learning the language and content.

English Language Mainstream: English learners who have acquired acceptable fluency in

English. The English Language Mainstream includes English learners who receive specific

instruction and supports in order to regain any academic losses developed in the main curriculum areas due to being a second language learner.

Alternative Program: With a parent exception waiver to be placed in an alternative program, a student will learn a language and receive ELD instruction focused on their English proficiency level and academic subjects taught in the primary language. An alternative program uses both English and another language to teach the academic content.

Primary Language (L1) Instruction: Instruction that refers to teaching in the predominant language of English learners.

English Language Development (ELD): It is the term used to describe an English Language Development academic program for children. It is a program focused on assisting students whose primary language is not English within the educational system.

Specially Designed Academic Instruction in English (SDAIE): It is instruction of grade level core standards in English intended for students speaking other languages than English. It is designed to focus on students who have reached a level of proficiency in English and have basic literacy skills in their language (California Department of Education, 2009, 2016).

Dual Language Program: A program in which students receive instruction that is given in two languages. The goal of the program is becoming proficient in both languages. Teachers usually teach as teams, one teaching one language and the other teaching the other language. The approach is called dual language.

Parental Exception Waiver: A request from the parent of an English learner to have his or her child placed in a program that is an alternative to the Structured English Immersion (SEI) or an English language mainstream classroom. An alternative program is a model that is in the form of bilingual education, such as the dual language program.

General Education Classroom/Traditional Classroom Program: In a general education classroom or traditional classroom program setting, it refers to teaching directly to the general student population. If English learners are part of the program it offers English Language Development (ELD) and support in the primary language.

Organization of Study Summary

This comparative study is organized in five chapters. Chapter 1 includes the background of the study, statement of the problem, the purpose of the study, the significance of the study, the operational definition of terms, theoretical framework, research questions, limitations, delimitations, and the assumptions of the study. The background of the study section speaks to the dynamics of the growing population of native Spanish-speaking students in America's public schools and the language that children speak within the public-school system. The statement of the problem section expresses the increase in Spanish speaking learners in California and how dual immersion programs support student achievement amongst English learners. The purpose of this comparative study is to determine if students in a Two-Way Spanish-English Dual Immersion Program perform higher than students in the general education English only classrooms. In the significance of the study section, the researcher provides support for the Board of Education's decision to implement a dual immersion program that will serve kindergarten through fifth grade students. The operational definition of terms section explains the educational jargon used to describe elements of instruction and programs used for English learners and dual immersion programs to support the understanding of this study. The theoretical framework shares the background of why the researcher has chosen to study this particular topic of dual immersion programs. Within the research questions section, the researcher examines the biliteracy development and English learner acquisition. In the

limitations section, the number of participants included in the study and the length of participation in the dual immersion program was examined. The researcher set boundaries on the purpose and scope of the study. Within the delimitation section, the researcher gained more understanding of the relationship between students increasing student achievement more in a dual immersion program rather than within a general education English only classroom. The final assumption of the study is that all participants would share truthfully in the data research through surveys and interviews.

Chapter 2 presents a literature review of this study related to outcomes of students participating in a Two-Way Spanish-English Dual Immersion Program. It includes the history of dual immersion programs, types of dual immersion programs, English language learner development, the importance of the leadership role, and components of successful programs. Chapter 3 has a focus in describing the methodology used for this research study. It also describes the participant selection process, data collection, and the analysis of assessments, surveys, and interviews. Chapter 4 presents the study's findings. Chapter 5 provides a summary of the entire study, discussion of findings, implications of the findings for theory and practice, recommendations for further research, and conclusions.

CHAPTER 2: REVIEW OF LITERATURE

Introduction

Educational researchers have studied the constructs of dual immersion programs for several decades. Instructional models, program structure, and leadership roles are major themes reviewed within the research framework in relation to the impact on student achievement in those studies on dual immersion.

The following review of literature represents the researcher's study focusing on the comparison of academic achievements of students participating in dual immersion programs to students that are not attending dual immersion programs. Specifically, Chapter 2 is organized into five sections: (a) history of dual immersion programs, (b) types of dual immersion programs, (c) the development of English language learners, (d) the importance of leadership roles, and (e) the components of successful dual immersion programs.

History of Dual Immersion Programs

Public schools in California currently use three types of instruction with English learners: (a) Structured English Immersion, (b) English Language Mainstream, and (c) Alternative Program. The Structured English Immersion and the English Language Mainstream use English only for teaching and learning. The Alternative Program models, such as Alternative Bilingual Education and Two-Way Bilingual Immersion, utilize the home language to teach English and content. These alternative programs such as dual language programs are intended to maintain the students' native language skills and academic content knowledge. Native language programs used to learn English, academic content, and develop primary language literacy are all accounted as bilingual programs. This study will compare and analyze the academic achievement between students in a dual immersion program and students in a general mainstream classroom.

Language acquisition strategies have been studied in educational systems for decades and have also been a focus in educational law and politics, in providing equitable access to all learners. Approximately 20% of the students in the California public school system speak a language other than English. Through an extensive literature review, past and current findings of dual immersion programs were reviewed. Many historical factors play a role in the conditions of dual immersion programs and their successes within the educational setting.

Genesee, Lindholm-Leary, Saunders, and Christian (2005) explain in the journal article, *English Language Learners in U.S. Schools: An Overview of Research Findings*, "The relation between L1 literacy and L2 literacy development also offer evidence of cross-language facilitation. ELLs with initial L1 literacy experiences, such as emergent and family literacy, as well as those with well-developed L1 literacy skills, progress more quickly and successfully in L2 literacy than ELLs" (p.372). Organizations use this knowledge to move to a solid management discipline that examines the links and components of how we educate English learners. Genesee et al. (2005) have been researching English language learners and dual language programs for the past several decades. These authors and researchers continue to publish books, journals, and articles that guide educational leaders in the design and implementation of programs and interventions for English language learners.

Types of Dual Immersion Programs

In the book, *Profiles in Two-Way Immersion Education*, by Christian, Montone, Lindholm, and Carranza, renowned experts in the field of dual immersion, share research of dual immersion programs that have been in place for seven or more years. There are few studies of students' attitudes toward their own bilingualism, particularly in two-way programs (Christian, Montone, Lindholm, & Carranza, 1997). Most of the information goes back as far as 1987.

Foundational research presented in this book describes the differences between different types of dual immersion programs: the 90:10, 80:20, and 50:50 models. The authors provide classroom guidelines that support students as they move from one language classroom to the next. In some models, students move from classroom to classroom when they switch the language of instruction. To maximize student access to curriculum and environmental aspects of the classroom, this type of dual immersion program mirrors teaching and classroom design in both languages. The only difference from one class to another is the language of instruction. In this design, student seating, classroom posters, writing walls, teacher desk formation and student materials are all in the identical space as the team partner classroom.

Drozdowicz (2012) shares extractions of information that will give some foundation and basis to this study on dual immersion programs. Drozdowicz (2012) reports,

It is widely known that the population in the United States speaking languages other than English has increased dramatically and is projected to continue on this trend. In support of dual language, the United States is one of the few first world nations that are monolinguals. Dual language programs provide an opportunity for English monolingual to become bilinguals. Data National Center for Education Statistics in 2005 as cited by Alanis and Rodriguez (2008) indicated children across the country that spoke a language other than English was approximately four million in 2004 (p. 6).

Researchers continue to look at bilingual or dual immersion programs to measure their success with English language learners. The research supports previous findings that students in dual immersion programs learning two languages simultaneously excel academically if the structure of the program has a strong foundation. Drozdowicz (2012) provides current research

more relevant to dual immersion programs supporting districts as they begin to implement dual immersion programs.

The second language acquisition authors present a collection of research reviews and studies for three immersion education programs: one-way, two-way, and indigenous. Fortune and Tedick (2008) share the findings of multiple researchers regarding teaching, learning, and language development. The information provided in this book is most useful to directors, superintendents or school board members when first deciding to implement a program. The strategies help stakeholders to understand the differences between the different types of immersion programs and focuses on instruction for language development and best practices.

Howard, Sugarman, Christian, Lindholm-Leary, and Rogers (2007) share the effectiveness of dual immersion programs for elementary students. The authors provide data and research related to English language learners and the educational environments that students in dual immersion programs thrive in more effectively. Howard et al. (2007) detail the underlying factors for the historically low performance of Hispanic students.

It is critical that we continue to find the most effective ways to teach Spanish-speaking language-minority students. The most effective programs are those that fall under the classification of Dual Language, a broad term that encompasses any "program that provides literacy and content instruction to all students through two languages and that promotes bilingualism and biliteracy, grade-level academic achievement, and multicultural competence for all students" (Howard et al., 2007, p. 1). The authors bring forward data and research that support dual immersion programs and English language learners within a public-school system. The authors outline findings from their research as well as those of other researchers in the field of dual immersion who are advocating for better education for English language learners. These

findings will guide the next steps as the researcher begins the discussion of students in dual immersion and their academic achievements in elementary school.

McCray explores the areas of English language development and achievement of English learners. McCray (2015) contends that, "research in bilingual education has identified that bilingual programs are the most beneficial in the maintenance of the home language, the development of English for English learners, and learning academic content" (p. 2). The author used standardized test scores to analyze the effectiveness of two-way dual immersion programs. This data, prior to the Smarter Balanced Assessment Consortium, provided a basis for the researcher's dissertation and laid the foundation for the examination of more current data that the state and the federal government are using. McCray shares information about bilingual education and how enacted government policies play a role in programs offered in the public systems. The history of English learners and the government policies are important to understanding the origin of bilingual education.

Murphy (2014) examines the effects of a transitional-bilingual program and a dual-language program, reviewing their effectiveness in developing students' home-language skills. In this journal article, Spanish proficiency is measured with first and second graders using pre- and post-assessments. Murphy (2014) provided data showing, "second-grade students in dual-language classrooms (who had longer exposure to the instructional model relative to first graders) scored significantly higher in verbal expression skills" (p. 182). Transitional-bilingual programs offer instruction in both languages at first but fade out the L2 language and mainly focus on English instruction. A child does not master both languages. In a dual-language program, both languages are developed for mastery. Along with Fullan's framework component on securing accountability, Murphy's assessment data brings awareness to the most effective

programs. "A central goal for educators who work with ELLs is to foster home-language proficiency in addition to the English skills often emphasized in schools" (Murphy, 2014, p. 191). The research provides a foundation because it gives validity to dual immersion programs and their effectiveness. This research is current and provides information to support the reason for which a dual-language program is used more frequently than a transitional-bilingual program.

Palmer (2009) uses ethnography and discourse analysis to explain the effects of a two-way immersion bilingual classroom and its impact on classroom conversation. Deborah Palmer's information uses deep analysis to present the negative effects on language minority students when the English-dominant students (especially White middle-class students) have more opportunities to dominate a conversation. This article focuses on equity for the student in a dual immersion program (Spanish time versus English time) and recommends that percentages of English and Spanish instruction are appropriate for the model. According to Palmer (2009), the teacher plays the most critical role in creating a classroom of equity. She uses guest teachers to model equity instruction in a linguistically diverse classroom. Palmer (2009) shares that a teacher must, "make deliberate efforts to have a balance within this classroom, offering English and Spanish-dominant speaking children as equitable as possible an opportunity to participate in the academic life of their learning community" (p. 178).

Soltero shares insights on bilingual education, dual immersion models, language acquisition, and the components of an effective program based on the dual language model; teaching and learning in two languages. Many global demands are shared in the book, which provides guiding points when looking at the challenge of teaching in a dual immersion program. Soltero shares strategies and guides designed to support teachers, administrators, and other professional educators who will be involved in the planning and operation of dual immersion

education. Soltero (2004) describes, "Essential dual immersion instructional and learning components, such as parent involvement, integrated and learner-centered approaches, and multicultural curriculum, become the building blocks for higher academic, linguistic, cultural, and social student outcomes" (p. 101).

English Language Learner Development

The growth in numbers of Hispanic learners in California public schools has implications for school systems. Concurrently, reduction in school and district resources further complicates the issues. The public education system must look at teaching and learning environments, determine the most effective teaching strategies and decide which programs of instruction will maximize English language acquisition rates of English learners. These decisions must be made in light of declining fiscal resources. School districts and teachers are finding it difficult to meet the diverse needs and to support the English language development of English learners. California continues to strive in meeting the academic achievement goals set for the English learner student, but meeting these goals comes with great challenges.

Proposition 227, also called the English Language in Public Schools Statute, was passed in 1998 and was intended to notably change the ways in which English learners (ELs) were educated. With the passage of the proposition, bilingual education was largely eliminated. English learners (ELs) were taught predominantly in English most of the day through a structured English immersion specialized program. English learners (ELs) were placed in this program no more than one year and then transferred into a regular mainstream classroom. In a regular mainstream classroom, the teacher instructs only in English for all core subjects all day long.

In 2016, Proposition 58 repealed restrictions on bilingual education restrictions so that students were allowed 1-year participation and then a subsequent transfer to the regular mainstream classroom. Proposition 58 allowed for the educational system to instruct students using multiple programs, including bilingual education, which included core instruction in a native language.

In 2016, the California Department of Education established two guidelines that local schools and districts must adhere to in order to receive state funding and achieve success with English learners. Closing the achievement gap will result when these state-established guidelines become widespread in public schools:

- Support English learners in attaining proficiency in English, linguistically and academically, combined with speakers of English (California Department of Education, 2016).

- Support English learners to achieve grade-level academic standards that are expected of all students (California Department of Education, 2016).

English language development (ELD) is provided to all English learners in California. This instruction is tailored to each student's English proficiency level and appropriate academic instruction. The English proficiency level and appropriate academic instruction are provided in Structured English Immersion, English Language Mainstream, or an Alternative Programs (see Table 2). Fortune (2012) shares, "Over nearly half a century, research on language immersion education has heralded benefits such as academic achievement, language and literacy development in two or more languages, and cognitive skills" (p. 9). Integrated instruction supports native English speakers and native speakers of another language increasing language

proficiency such as Structured English Immersion, English Language Mainstream, and

Alternative Program.

Table 2

Academic Integration Instruction.

English proficiency level	Academic instruction
Structured English Immersion	A classroom setting where English learners who have not yet acquired reasonable fluency in English, as defined by the school district, receive instruction through an English language acquisition process, in which nearly all classroom instruction is in English but with a curriculum and presentation designed for children who are learning the language.
English Language Mainstream	A classroom setting for English learners who have acquired reasonable fluency in English, as defined by the school district. In addition to ELD instruction, English learners continue to receive additional and appropriate educational services in order to recoup any academic deficits that may have been incurred in other areas of the core curriculum as a result of language barriers.
Alternative Program	A language acquisition process in which English learners receive ELD instruction targeted to their English proficiency level and academic subjects are taught in the primary language, as defined by the school district. Through a parental exception waiver, students can be placed in an alternative program.

Research in bilingual education has identified that bilingual programs are the most beneficial in the maintenance of the home language, the development of English for English learners, and learning academic content (Lindholm-Leary, 2001). Bilingualism affords students metacognitive skills that monolinguals do not have, and these skills transfer to other types of learning. This is also an issue of equity so both English and Spanish learners get access to this advantage in dual immersion programs.

Carrera-Carillo and Smith (2006) wrote, "We live in a global era that shapes world politics, commerce, the environment, and international relations. Our increasingly connected world cries out for cultural understanding and for the desire and the ability of different nationalities to communicate" (p. 73).

For over 25 years, Beeman and Urow both have studied and researched in the field of bilingualism and biliteracy. Both share information surrounding dual immersion programs and the structure necessary for increased results. Their research focuses on Spanish as a minority language in a majority culture, on students using the two languages to develop literacy, and both languages being governed by distinct linguistic and cultural rules. Beeman and Urow (2013) share, "Two-thirds of English language learners currently in the United States were born here and are simultaneous bilinguals whose knowledge is shared across languages" (p. 33). The authors provide information describing how to bridge language development and language literacy.

Genesee, Lindholm, Saunders, and Christian (2006) in *Educating Language Learners: A Synthesis of Research Evidence* explore students with limited or no proficiency in English within the United States. These authors have conducted extensive research on second language

learners, immersion programs, and instructional strategies and student learning. They focus on literature and research in oral language development, cross-linguistic issues, instructional issues for literacy, and academic achievement. The literature presented is supported by findings with norm-referenced assessments, demographics, ethnicity, and economic status. From the program sampling and statistical analysis, the authors draw conclusions about English language learners and dual immersion programs. Genesee et al. (2006) explain, "The most extensively documented non-school factor related to oral language development is language use outside of school, specifically at home with family and also among peers" (p. 31).

Drawing on and presenting the scientific research on English learners since 1980's, Genesee, Lindholm-Leary, Saunders, and Christian are long time researchers of dual immersion programs. The subset focus of their research reveals the longitudinal development and influence of instruction regarding English language learners. Their research outlines achievement gaps in oral language, reading comprehension, and academics between English language learners and native English speakers.

Arturo E. Hernandez has researched bilingual language processing and second language acquisition, which are foundational in dual immersion programs. Much of his research projects are of national scope and provide insights to districts throughout the world supporting bilingual education. Hernandez shares his findings on early learning, language proficiency, and two-language learning. He uses the following three factors as a basis for bilingualism: Age of acquisition, language ability, and control. Hernandez (2013) proposes, "The idea that age of acquisition played a profound role in the formation of memories" (p. 6). Hernandez (2013) uses the findings in his research to make the connections of general cognitive processing and how the brain learns two or more languages. Hernandez' work illustrates brain and language processes.

Hernandez (2013) explains, "People who speak two or more languages have significantly better cognitive abilities than those who speak one" (p. 31). Understanding language is one of the most complicated tasks that the brain performs. Alban (2016) states, "Studies show that learning a second language provides benefits such as higher intelligence, memory, and concentration. Language is so complex that as a brain is learning a new language, it is also getting a good workout."

In the book, *Classroom Instruction That Works with English Language Learners*, Hill and Flynn share research data and present effective instructional strategies for English learners. The authors discuss the stages of second language acquisition and also present elements of successful language acquisition programs, such as nonlinguistic representations, setting objectives, providing feedback, cooperative learning, summarizing note taking, parent involvement, and practices to support classroom instruction. The chapter on setting objectives and providing feedback is of value, especially as it relates to dual immersion. Hill and Flynn state, "Effective learning requires feedback and when teaching ELLs, it is particularly important to ensure that your feedback is comprehensible, useful, and relevant" (p. 31). Classroom objectives are important as they support the teacher in keeping the lesson focused and provide students with a guiding tool to analyze what they have learned. Teacher feedback has always been important, but recent studies are emphasizing the need for specific feedback and the support it provides for student learning. Hill and Flynn provided a connection to the No Child Left Behind Act of 2001 calling for a quality education and accountability for all children. The elements of the book support second language learners and dual immersion students.

Importance of the Leadership Role

Conclusive data and research on how educational leaders can successfully implement dual language programs is lacking (Elfers & Stritikus, 2014). Fullan (2014) supports the effectiveness of the principal if the leader serves as an overall instructional leader who maximizes the skills and competence of all teachers who, in turn, improve student learning. In his book, *The Principal: Three Keys to Maximizing Impact*, Fullan (2014) shares scenarios that delve into the current role of the principal. He presents scenarios of principals who are overwhelmed with the plethora of administrative tasks and roles, which result in diminished effectiveness as a school leader. He argues that the role of the principal, as a direct instructional leader, is not an effective model of school leadership. Fullan (2014) focuses on the need to re-conceptualize the role so the principal becomes a force for improving the whole school. Leaders with this outlook and growth mindset look at re-branding schools with a specialty focus, such as Two-Way Spanish-English Dual Immersion programs. With years of research proving that learning in a Two-Way Dual Immersion Program environment increases a child's academic achievement, school leaders are more readily using these programs at their campuses. To achieve deeper and sustainable performance levels at a school site, student performance must increase and the instructional skills of staff must improve. Fullan identifies three elements to successful school leadership in *The Principal: Three Keys to Maximizing Impact: Learning Leader, System Player, and Agent of Change*.

Similarly, Northouse's transformational concept as a leader aligns to this type of work: "Transformational leadership is concerned with emotions, values, ethics, standards, and long-term goals. It includes assessing followers' motives, satisfying their needs, and treating them as full human beings" (Northouse, 2016, p. 161). This dissertation study supports the correlation

Northouse (2016) found between the effectiveness of the leader and the success of the school. This study will include staff, student, and parent surveys that analyze the role of the leader and how he or she is a significant factor in the increase of program success and student achievement.

Northouse (2016) details the approaches and theories of different types of leaders. In his book, he presents systematic components that impact leadership, such as traits, skills, behaviors, and situational approaches. Northouse (2016) also discusses different leadership styles, such as transformational, authentic, servant, and adaptive leadership styles. Different types of leadership styles will be researched in this study, including the styles of leaders at schools that provide bilingual programs. Northouse (2016) emphasizes the importance of inspiring others as you lead them, while concurrently understanding and adapting to their needs as followers. Northouse (2016) explores many individualized characteristics that a servant leader possesses; listening, empathy, healing, awareness, persuasion, conceptualization, foresight, stewardship, commitment to growth, and building community. Effective leaders, according to Northouse, must oversee and champion the work of the program, as well as effective classroom instruction. Northouse (2016) provides reflective surveys throughout the readings that assist the reader in self-evaluating their own leadership strengths and areas for growth. The researcher used the Multifactor Leadership Questionnaire, the Adaptive Leadership Questionnaire, and the Dimensions of Culture Questionnaire to identify personal leadership practices. These instruments will be used to provide the perspective in this study, by presenting academic success data and the multiple factors that are involved in effective Two-Way Spanish-English Dual Immersion programs.

Carol Dweck has studied in the fields of personality, social psychology, and developmental psychology and is widely and highly regarded around the world. Dweck talks

about a fixed mindset versus a growth mindset. A fixed mindset is one where you are told who you are and neither you nor your capabilities change. In a growth mindset you are told that you have the ability to learn, to adapt, and to fulfill your potential. As Dweck (2006) shares, "Every word and action can send a message. It tells children—or students, or athletes—how to think about themselves" (p. 170). Dweck (2006) goes on further to explain, "It can be a fixed-mindset message that says: *You have permanent traits and I'm judging them.* Or it can be a growth-mindset message that says: *You are a developing person and I am interested in your development"* (p. 173). It is just as important to look at instruction and makeup of a classroom, as well as the school culture and environment in which it resides. Dweck's work brings understanding to educators about leading, changing the culture and helping others with shifts that are occurring in education. Creating a growth culture is a major component of effective dual immersion programs. Dweck's work focuses on the mindset of leaders, parents, teachers, coaches and students within the educational system. Along with Dweck's work, Greene (2014) concurs with a strong leadership role as being, "Leaders who foster and encourage innovation and who cultivate a school climate that is geared toward continuous improvement" (p. 233).

Hooper and Bernhardt (2016) discuss three different leadership methods: Instructional, adaptive, and transformational. Building staff capacity to lead is an integral part in becoming an effective leader. The book titled *Tri-Model Leadership* by Hooper and Bernhardt provides a framework and commitments for leaders to follow that will bring more equity to their work. Hooper and Bernhardt (2016) argue that effective leaders must have a strong foundation in curriculum, instruction, and assessment. They also explain that the instructional leader must be able to create conditions of learning for the children. Hooper and Bernhardt (2016) write, "The key question that adaptive leaders must keep at the forefront when examining structures and

processes is, "Are these the right thing to do in the current time and context?" (p. 69). The adaptive leader strives to improve all areas of the learning organization by engaging all stakeholders along the improvement system continuum. The last mode presented by the authors focused on modeling cultural responsiveness through transformational leaders. Transformational leaders rally an intentional and deliberate engagement of members of the organization collectively building their trust and a common value. Although the book provides many theories on leadership, it does not have a focus on dual immersion and second language learning. Culture, according to Hooper and Bernhardt, plays a significant role in Dual Immersion program implementation. Instructional, adaptive and transformation leadership must be implemented with a common goal, vision, and belief.

Garcia, Johnson, and Seltzer (2017) provide focus and direction for educational leaders in mixed language environments in fourth through twelfth grade. Their findings suggest that educational leaders guide teaching, form instructional programs, and review action-oriented research. The authors report ways that educators, principals, and teachers can build instructional classrooms that are supportive and inclusive for bilingual students. The book describes trans-languaging classroom practices, framework, pedagogy, instructional design, assessments and well-being concepts. Garcia, Johnson, and Seltzer (2017) share, "The term trans-languaging can be understood in two different ways" (p. 2). Garcia et al (2007) also add, "From a sociolinguistic perspective, trans-languaging can be understood as the dynamic language practices of bilinguals and from a pedagogical perspective, trans-languaging can understand as an instructional and assessment framework that teachers can use strategically and purposefully" (p. 2).

Fiarman (2017) details that, "Teacher leadership is building a school-wide leadership mindset" (p. 23). Principals and teachers must begin adopting and thinking differently about

their views on their specific roles. Each person must take a position on being part of the culture.

A culture of collective responsibility brings shifts in thinking about how and what students learn.

A common practice of protocols and strategies supports equity learning resulting in shared

student performance outcomes. School leaders, including teacher leaders, must place more value

on each other's skills and insights rather than on demonstrating their own expertise creating

meaningful work. This leadership mindset supports the Two-Way Spanish-English Dual

Immersion program concept that teachers mirror their instructional lessons from classroom to

classroom and grade level to grade level, moving the instruction from Spanish to English as it

transfers for each student.

Successful Programs

The domains emerging for a successful dual immersion program identified from the

qualitative and quantitative data are academic achievement, student engagement, cultural

integration, college and career ready, and becoming bilingual and bi-literate (see Figure 6).
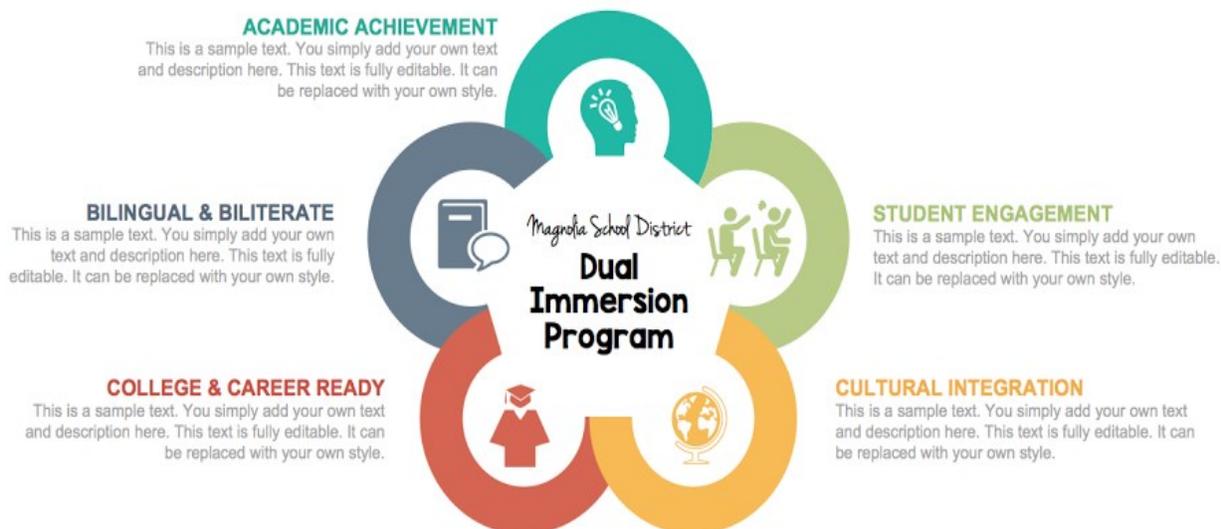
Figure 6. Domains emerging for a successful Dual Immersion program.

There are 2.7 million students who speak a language other than English in their homes in California, which is 42.8% of California's public-school enrollment; 83.5% of these students speak the Spanish language. The majority of English learners are enrolled in elementary grades, which represents 73% of the students. (California Department of Education, 2016). This dissertation study takes place in District XYZ in Southern California that mirrors or exceeds the state's proportion of the English learner population. In the study, 65% of the students identify Spanish as their native language in District XYZ (Dataquest, 2016-17). A total of 214,156 Spanish speaking English learners are within the Orange County boundaries, which represents 43% of the student public school population. District XYZ far exceeds the average county rate of English learners.

Identifying the root causes of low student performance in a multilingual classroom is a challenge for educators. Oftentimes, the causes are a combination of the learning environment in an immersion class and/or the result of the student's limited language and learning abilities. Fortune and Menke (2010) detail information that schools have relative to the average performance of classroom peers. Disparate student performance leads school teams to question whether a student could ultimately be successful in an immersion program or perform at higher levels in a different instructional environment. Strategies suggested by the author support teams at the school to better assess each individual student case. Fortune and Menke (2010) share that the book, "Provides educators in language immersion settings with practical, empirically-motivated advice on how to best address the needs of students with diverse abilities" (p. 1). The following topics are emphasized and broadened in their understanding: Program and suitability and learner disability and best practice at the classroom-and program-level.

Carrera-Carillo and Smith (2006) have years of knowledge working with English learners. The authors, both from dual immersion program backgrounds, consult and provide professional development opportunities for districts across the world. They outline a seven-step process for school districts to start up a dual immersion program. The seven-step process for a successful dual immersion program includes (a) understanding and planning for dual language immersion, (b) organizing the classroom, (c) planning instruction, (d) best practices in teaching, (e) learning through hands-on activities, (f) assessing and accountability, and (g) building community support. Although the book provides an extensive list of how to set up a successful dual immersion program, it does not provide the data and research to support the dual immersion program. It does bring into light the community, culture and capacity building that aligns with the work presented by Fullan and Quinn in their book, *Coherence*. Carrera-Carillo and Smith (2006) share, "The community will value this type of school if those who develop it treat it as a product that must be sold" (p. 66).

Howard, Sugarman, Christian, Lindholm, and Rogers (2007) provide a tool that can be used in designing a dual immersion program. The authors took into consideration federal and state requirements originally connected to the No Child Left Behind Act of 2001. Most of the components are still aligned to the expectations and requirements of federal and state law. As noted by Howard, Sugarman, Christian, Lindholm, and Rogers (2007), "The guiding principles are grounded in evidence from research and best practices" (p. 3). Program effectiveness is the main focus in creating the tool used for programs could to be measured throughout the states. Again, in line with the research by Fullan and Quinn (2016), these authors also believe that the community and culture have an impact on the success of the program. Much of the research that

is presented includes data regarding accountability, curriculum, instruction, staff quality, professional development, program structure, family and community.

Summary

The literature reviewed for this study focused on understanding successful elements of dual immersion programs and their resultant academic effects. Evidence overwhelmingly demonstrates that dual immersion programs result in second language acquisition and academic growth in core subjects. Ford (2014) shares, "Pupils who learn a foreign language outscore their non-foreign language learning peers in verbal and math standardized tests, indicating that learning a second language is a cognitive activity not just a linguistic one". Longitudinal studies by Harvard University, along with many researchers over the past decades, have confirmed that learning additional languages in public education increases cognitive skills in young children.

Perkins (2014) explains, "Young children are hard-wired to learn language in the first few years of life. When frequently exposed to two languages, they unconsciously acquire the second language naturally, applying the same skills they use to acquire their native language" (p. 1). Children learn skills and information quickly as they develop at extraordinary paces. Processing at a young age is inherent in a child and natural to their brain because children know no other boundaries, so a new language and information they receive is remembered and comprehended easily. The enrichment approach is viewed as providing "clear advantages to students in attaining high levels of academic achievement, with eventual benefits in expanded career choices and economic opportunities" (Mora, Wink, & Wink, 2001, p. 439).

Lindholm-Leary has continued to share research over the last few decades showing "Results that Dual Language students score as well as or higher than their peers in non-Dual

Language programs and has been reported in Spanish, Italian, Chinese, and Korean Dual Language programs" (Lindholm-Leary, 2001, p. 56).

Researchers continue to publish their studies, explaining that students in dual immersion programs increase in academics at a young age. This study with District XYZ and the matched sample-controlled group of students in the Two-Way Spanish-English Dual Immersion program compared to the controlled group not participating in the Two-Way Spanish-English Dual Immersion program aligns the findings with the many researchers that demonstrate the successes of dual immersion programs across the nation.

This study compares performance results of dual immersion students with non-dual immersion students using a variety of measures such as English Language Proficiency Assessments for California (ELPAC), Smarter Balanced Assessment Consortium (SBAC), Language Assessment Scales Links (LAS Links), District Summative, Interim, Unit, and Formative Assessments.

CHAPTER 3: METHODOLOGY

Introduction

This comparative study utilized both qualitative and quantitative measures to determine the effectiveness of the Two-Way Spanish-English Dual Immersion program at School A. The primary goal of this mixed methods study was to test the research questions that relate to student achievement through quantitative measures such as district and state assessments of dual immersion participants, student achievement through district and state assessments of dual immersion non-participants, along with qualitative measures using surveys with students, parents, and teachers as stated in Chapter 1. Separate instruments were used to measure and compare these variables. The mixed methodology utilized to test the research questions is presented in this chapter and will give a well-rounded understanding of the academic effects of an elementary Two-Way Spanish-English Dual Immersion Program between dual immersion students and non-dual immersion students. The chapter is arranged into four sections: (a) selection of participants, (b) instrumentation, (c) data collection, and (d) data analysis. The following questions will be addressed in this dissertation study:

1. What are the performance scores in language arts and mathematics standardized tests of students in Two-Way Bilingual Immersion instruction? (Quantitative)

2. In what ways do the scores on standardized tests with students in a Two-Way Bilingual Immersion program compare to monolingual English-speaking students in an English Language Mainstream program? (Quantitative)

3. How do students, parents, and teachers interpret their experience in the dual immersion program? (Qualitative)

Setting and Selection of Participants

Participants in the treatment and comparison groups are elementary level students enrolled in either a Two-Way Bilingual Immersion program or English only classrooms in a Southern California public school. There are many key components of a successful dual immersion program including the role of the leader as a learner, commitment from all stakeholders, program design, teacher efficacy, and accountability.

Specifically, this study includes Grade 5 English learner students in a Two-Way Spanish-English Dual Immersion program, Grade 5 English only students in a Two-Way Spanish-English Dual Immersion program, Grade 5 English learner students not participating in a Two-Way Spanish-English Dual Immersion program, and Grade 5 English only students not participating in a Two-Way Spanish-English Dual Immersion program. All of the matched participants have been enrolled at the same school since kindergarten exposed to the same learning standards, research-based state approved curriculum, instructional strategies, and leadership qualities except that the participants in the Two-Way Spanish-English Dual Immersion Program have been instructed in both Spanish and English while the others have remained in a monolingual instructional program.

The matched sample groups in the study (see Table 3), each of them including two sub-groups. Group A participants in the study consist of 43 students: 21 English-learner students and 22 English only students participating in the Two-Way Spanish-English Dual Immersion program. There were two parental consent forms that were not signed in Group A, which were two English only students. Group B participants in the study consisted of another 43 students: 17 English-learners students and 26 English only students not participating in the Two-Way Spanish-English Dual Immersion program.

Table 3

Participants in the Study by Grade, Sample Size and Gender

Characteristic	Group A Two-Way Spanish-English Dual Immersion students		Group B English Language mainstream students	
English Language Status	English learners (includes IFEP & RFEP)	English only	English learners (includes IFEP & RFEP)	English only
Grade	5	5	5	5
Sample Size	21	22	17	26
Gender	11 males 10 females	10 males 12 females	6 males 11 females	12 males 14 females

The selection of the participants was based on program participation, ethnicity, gender, and language characteristics pertinent to this study. The Home Language Survey completed by families upon enrollment determines how each student is classified, whether as an English learner or English only. The California English Language Development Test (CELDT) determines the skill set and level of English proficiency in the listening, speaking, reading, and writing domains by using an overall proficiency score. It is administered each year to all English learners and to new district enrollees whose primary language is not English. The purpose is to identify students who have limited English proficiency and to monitor existing English learners. The English Language Proficiency Assessments for California (ELPAC) is the successor to the California English Language Development Test (CELDT) and is also used to assess and monitor EL students' progress toward English language proficiency. The California Department of Education (CDE) expects to be fully transitioned from the CELDT to the ELPAC as the state's assessment of English learners by the year 2018–2019.

Surveys exploring the success of the students and the program were completed in this study. These surveys were given to a select sample providing in-depth views on the program and its successes programmatically, instructionally, and culturally. Patton (1990) explains, "For example, if the purpose of an evaluation is to increase the effectiveness of a program in reaching lower-socioeconomic groups, one may learn a great deal more by focusing in depth on understanding the needs, interests, and incentives of a small number of carefully selected poor families than by gathering standardized information from a large, statistically representative sample of the whole program" (p. 169). The selected participants were sampled through qualitative open-ended questions that allowed them to share their personal views.

Sampling Procedures

The Two-Way Spanish-English Dual Immersion program at School A has two Grade 5 classrooms that were reviewed to be participants in this study. The criterion sampling included 41 students selected from the Two-Way Spanish-English Dual Immersion Program combined and compared to the 43 students that were selected from the general education English only classrooms. Both sets of students have the same characteristics such as attending the same school, being enrolled at School A since kindergarten, and exposed to the same curriculum and instructional practices over the past six years. The comparable characteristics of these matched group of students is that they have been at the same school since kindergarten, classified as an English learner or English only student, live within a low socio-economically disadvantaged area, come from similar parent education background, and learn from quality teachers with the same professional development background.

The review sampling and set up of students in Group A and Group B (see Figure 6) is organized using an excel spreadsheet. With the support of the Education Services Assessment

Team in District XYZ, the Grade 5 students at School A were organized to identify which students have been at School A since kindergarten, which students are in the Two-Way Spanish-English Dual Immersion program and which students are in the general education English only classrooms. This process will help to monitor the students as the sampling may change depending on who remains at the school and who may move before the data was collected.

The participants were chosen based on their English language status, grade level, gender, ethnicity, and the enrollment status in either the Two-Way Spanish-English Dual Immersion program or from within the general education English only classrooms. Along with the sampling of students, teachers and parents were also selected to be participants in this study. In the qualitative portion of the study, participant students, participant parents and the dual immersion participant teachers at School A were each given a survey. The information from these surveys and the assessment data were analyzed to make determinations based on the analyses of the collected data.

Instrumentation and Measures

In this study, quantitative data from district interim, unit and chapter assessment instruments were analyzed in subjects such as English Language Arts and Mathematics. Included in the study are data results from the California state computer-adapted tests and performance tasks known as the Smarter Balanced Assessment System. Gathering qualitative survey data from students, parents, and teachers provided the researcher in-depth personal knowledge and perspectives on how they feel regarding the Two-Way Spanish-English Dual Immersion program.

Each survey was created with the intention to gather perspective data from students, parents, and teachers in regard to the dual immersion program. After each survey was drafted, a

trial survey was issued to one student, one parent, and one teacher to gain validity. The trial

survey provided the researcher with an idea on the type of data that would be established and

collected. Each trial participant was allowed to provide feedback about what made sense, what

did not, and what needed to be clarified.

A survey was distributed to each participant respectively. The student and teacher

participants completed their survey at school in a classroom environment. Once completed, the

principal collected each numbered and labeled survey and placed them in a sealed envelope. The

envelope was delivered to the Coordinator of Programs and Assessments. The survey data was

entered into an excel spreadsheet for analyzing. For the parent surveys, each participant received

it in the mail via Certified US Mail. The mailed envelope also included a self-stamped return

envelope for convenience. All parent surveys were returned to the Coordinator of Programs and

Assessments, which ensured confidentiality. Participation in the survey is completely voluntary

with no financial compensation. Refusal to participate will render no negative consequences

with the parent or the child. Participation by the participant in this study may be discontinued at

any time.

To avoid bias and avoid damage to the data, the Coordinator of Programs and

Assessment gathered, stored, and secured all materials including the coded surveys. This process

was explained to all participants so they could feel assured of their safety and of any potential

damage to their personal information. I avoided any conflict of interest by removing myself

from the gathering and storing of data. Also, the hiring of all teachers for the program had

previously been completed thus alleviating my authority bias in the hiring process regarding the

staffing of the Two-Way Spanish-English Dual Immersion program.

A master list was kept on all survey participants to identify them and ensure that each had completed the survey. Once surveys were completed, the lists were destroyed to keep individual responses and data collected from survey participants confidential and private to prevent discrepancies and keep the study valid.

In the research interview, Romero-Gonzalez (2008) indicates that part of the success in dual immersion programs is due to parents, school leadership and community response. The study responses from participants of the current study adds to the body of research on the comparison of Two-Way Spanish-English Dual Immersion programs versus programs where children only participate in a general education English only instructional classroom.

The reliability and validity of the results from the surveys are strong as the researcher supplemented his findings with qualitative analyses done in collaboration with an outside rater. The interrater reliability was high due to investigative analyzing with the scoring of the participant instruments. In the qualitative coding, the researcher first cleaned up the data organized it and placed responses verbatim in an Excel chart. After cleaning up and organizing the data, the researcher provided the data to the outside rater with the verbatim responses. Next, the researcher and the outside rater coded the responses independently using color-coding to identify the different emerging themes. Both the researcher and outside rater created five to seven themes per question on the survey. After the researcher and outside rater independently coded the themes from each participant answer, they met to discuss the codes developed. An example of different code names that the outside rater had was "job opportunities" whereas the researcher had "future jobs". Together, it was decided to code it as "job prospects". The researcher and the outside rater also had to review responses such as "happy", "grateful", and "proud" and make determinations on the types of words or phrases that fit in the "positive

emotions" category. In this case, there were 5 out of 41 responses (12%) related to "positive emotions" and there were 2 out of 41 responses (5%) related to "indifferent". After much deliberation, common codes were determined for the data analysis that captures the essence of the responses. Another example is the question, "Did you know you were in a specialized program?" 40 students answered, "yes, I knew" (98%, $n = 40$) and "no, I did not" (2%, $n = 1$).

<div align="center">

Plan for Data Collection

</div>

This study employed a mixed methodology of data collection and analysis. These two methodologies will be explained separately.

Quantitative Data Collection

The first step in the quantitative data collection process included the district assessment data collection by the Educational Services Assessment Coordinator using the EADMS data systems. The collection of assessment data received by the state was then organized and coded according to the proficiency mean scores.

Qualitative Data Collection

The qualitative method of data collection process included the distribution of a copy of each survey to each student, parent and teacher participating in the study. The student and teacher groups were surveyed at the school in a private conference room or classroom setting. The parent group was mailed the survey to their home with a stamped return envelope. Each survey inventory from individual participants was coded using DI1-DI43 for the dual immersion students (included the two students that declined to participate), S1-S43 for non-dual immersion students, P1-P43 for parents (included the two parents that declined to participate), and T1-T14 for the teachers. A master list was kept on all survey participants to identify them and ensure that each participant had completed the survey. Once all the surveys were completed, the lists

were destroyed to keep the survey results confidential and private, prevent discrepancies and thus keep the study valid.
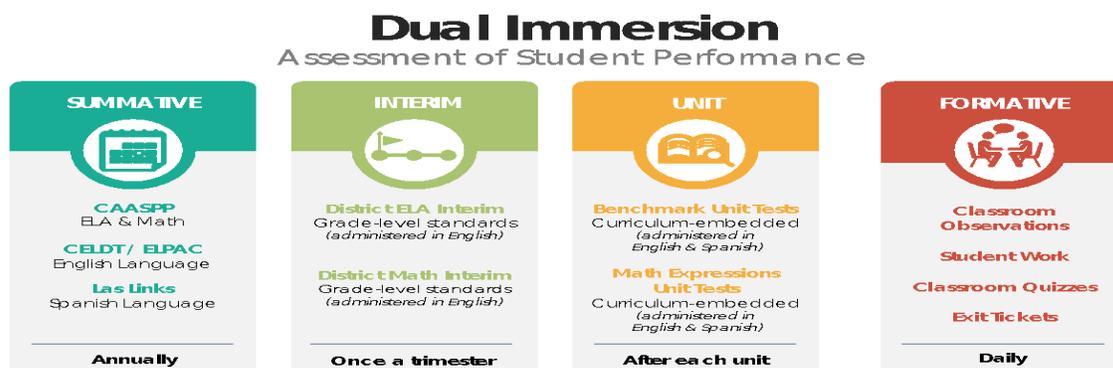
Figure 7. Assessment of student performance.

Plan for Data Analysis

Data analysis was based on a mixed methodology of quantitative and qualitative data. The quantitative portion of the study used district and state assessments in the areas of English Language Arts and Mathematics (see Figure 7). The district assessments were analyzed using the ANOVA measure with the Unit Tests for English language Arts and the Chapter Tests for Mathematics. Student performance scores were used to evaluate student success in the dual immersion program. The performance scores in language arts and mathematics standardized tests of the students in the Two-Way Bilingual Immersion program will be compared to the students in the general education mainstream classrooms.

In California, students in Grades 3 through 8 and Grade 11 are administered the Smarter Balanced Summative Assessments in English language arts and mathematics. Proficiency mean scores in the state assessments were analyzed in both English language arts and mathematics

using the *t*-tests. Achievement on district assessments, carried out at the beginning of the year, were compared to the end of the year assessments to assess progress. Students, parents and teachers provided insights and perspectives from their experience in the dual immersion program. The data received from the surveys were analyzed. In analyzing the data, the researcher came up with ways to categorize emerging themes while using interrater reliability. Another rater will support the process of coding and categorization to promote validity and reliability.

With the support of the Education Services Assessments Coordinator, all assessment results were entered into an Excel spreadsheet, including all participants of the study listed with their responses. The researcher compared the mean proficiency scores of the selected students in the dual immersion program to the selected non-dual immersion students. The researcher also looked for discrepancies, highlighted the differences discovered between Groups A and Group B and identified the positive and negative programmatic trends.

Analyses of the qualitative surveys given to students, parents and teachers were completed to shed light on how each stakeholder plays a valued role in the success of a dual immersion program (see Appendices A, B, and C). This examination of diverse perspectives expressed in the surveys supported previous findings about the effects of dual immersion programs on students. As the results from the surveys are tabulated, conventional coding was used to assign themes as they emerge based on quantitative and qualitative data (see Figure 8).

Figure 8. Quantitative and qualitative results.

In this study, peer debriefing was carried out to give validity to the study. Part of the analysis took into consideration that the researcher worked in the district from which the participants had been chosen. It also took into account that the researcher had been the direct supervisor of the Two-Way Spanish-English Dual Immersion program. The researcher's role and experiences with English learners and the Two-Way Spanish-English Dual Immersion program may influence the outcomes, as there are some preconceived notions of the program's success. The researcher used investigator triangulation, which combined multiple methods to give validity to the study.

<div align="center">**Ethical Issues**</div>

The researcher anticipated potential ethical issues to arise based on several factors: he is an employee of District XYZ, the past Director of Educational Services and Dual Immersion program, the current Executive Director of Human Resources that oversees the employment of

the teachers in the Dual Immersion program under study, and is familiar with the district program.

The Researcher

The researcher has over 22 years of educational experience, as a classroom teacher, reading resource teacher, intervention teacher, curriculum specialist, assistant principal, principal, coordinator of education, director of education and executive director of human resources. In these varied roles, the researcher has been exposed to and engaged in many different types of programs whose aim is to increase student achievement.

The researcher's 22years in the field of public education have been dedicated entirely to students from socio-economically disadvantaged backgrounds and second language learners. The researcher's goal over the past 22 years has been to contribute to closing the achievement gap between these students and their English-speaking peers, in order to make them competitive for college and careers with career-ladder opportunities in the 21st Century. His early experiences and resultant successes using Dual Immersion programs made him an advocate and spokesperson for them. Dual immersion programs are increasing across the nation, in part, to enhance students' education and prepare them to become global citizens. These programs provide students the opportunity to acquire languages other than their native language as they gain subject matter knowledge and acquire new skills. The United States has shown a massive increase in Two-Way Immersion (TWI) programs since it was created in 1962 and as of 2011 there are now over 422 TWI programs nationally of which 201 programs are based in California (Center of Applied Linguistics, 2011).

Summary

This chapter restated the purpose of this research and presented the research questions. The chapter addressed the methodology and process used to test the research questions that relate to dual immersion. This chapter included an introduction, setting and selection of participants, sampling procedures, instrumentation and measures, plan for data collection, plan for data analysis, ethical issues and a summary. This study was conducted to compare the academic effects of an elementary Two-Way Spanish-English Dual Immersion program on dual immersion students as compared to non-dual immersion students. The goal of the researcher was to examine the quantitative assessment results combined with the qualitative survey results to understand the effects of participating in a dual immersion program. The qualitative results from the surveys shed light on the perspectives of all stakeholders: students, parents, and teachers.

A preliminary pilot of the surveys was administered. One student, one parent and one teacher were selected to investigate what they may be interested to find out about students enrolled in a Two-Way Spanish-English Dual Immersion program. As a preliminary pilot, the Superintendent and Assistant Superintendent of Educational Services were also invited to share what they may want to find out through this study. By these preliminary pilot sessions, the researcher was able to create optimal questions for each student, p and teacher survey. Results of the data analysis are presented in the following chapter.

Expected outcomes are that the results will align to the past and present research completed over the past few decades. The optimal outcome would be that the data for Group A and Group B show that participating in a dual immersion program increases language proficiency and academic achievement.

CHAPTER 4: PRESENTATION AND ANALYSIS OF DATA RESULTS

Introduction

This study intended to investigate, analyze and evaluate the academic effects of an Elementary Two-Way Spanish-English Dual Immersion program between dual immersion students and non-dual immersion students. The purpose of this study was achieved by examining the quantitative district and state standardized test data along with the qualitative survey data produced by the students, parents, and teachers interpreting their perspectives on the dual immersion program. This chapter presents the results of the data analysis of the three stated research questions:

1. What are the performance scores in language arts and mathematics standardized tests of students in a Two-Way Bilingual Immersion instruction?

2. In what ways do the scores on standardized tests with students in a Two-Way Bilingual Immersion program compare to monolingual English-speaking students in an English Language Mainstream program?

3. How do students, parents and teachers interpret their experience in the dual immersion program?

The data will be presented for each question and then analyzed. The quantitative data analysis of district and state assessments was reviewed identifying positive and negative programmatic trends. Surveys done with teachers, parents and students helped shine a light on how each plays a valued role in the success of a dual immersion program. Part of the research used the qualitative method such as perspectives gathered through interviews, surveys with a focus group, and looking at the similarities and differences between dual immersion students and non-dual immersion students. The researcher incorporated the qualitative method into the

research along with the quantitative method, analyzing state assessment data, district assessment data, and authentic classroom artifacts. This mixed method study thus aimed to provide a well-rounded understanding of the academic effects of the program on dual immersion and non-dual immersion students.

Demographics

Data from 86 students in the Magnolia School District was used in this analysis longitudinally throughout their primary education. In kindergarten, the students were separated into two groups, 43 students (21 male; 22 female) were selected from the dual-immersion program, and 43 students (18 male; 25 female) were selected from the traditional (English only) classrooms. The primary aim of this study was to examine the efficacy of teaching multiple languages simultaneously and its potential effects on participants. Since some students start with different language backgrounds, it is crucial to divide the students into groups based on language ability in Spanish and English. Students were classified when they first enter the public school system into one of four categories of English language proficiency as measured by the California English Language Development Test (CELDT): English Learner (EL) if they did not meet the proficiency requirements to be classified as fluent, Reclassified Fluent English Proficient (RFEP) if they have been reclassified as English proficient, Initially Fluent English Proficient (IFEP) if they have been reclassified after the first try, and English Only (EO) if they have never been English Learners (see Table 4). The IFEP category consisted of only three students total so they were combined with the RFEP students into one reclassified category of students fluent in English but with a Spanish background. A single category for reclassified status will also help improve statistical power and reduce the number of parameters.

Table 4

Numbers of Students by Gender in the Dual Immersion and Traditional Program per English Classification Category.

| | English Classification | | | | | | | |
| | EL | | RFEP | | IFEP | | EO | |
Program	M	F	M	F	M	F	M	F
Dual Immersion	6	3	4	7	1	0	10	12
Traditional	1	4	5	5	0	2	12	14
Totals	7	7	9	12	1	2	22	26

Methods

Students from both groups were evaluated throughout the study with both statewide and district-wide exams for English language arts and math. English proficiency assessments included a statewide English Language Assessment from the Smarter Balanced Assessment Consortium (SBAC-ELA) each year from Grades 3 to 5 and a District Interim English Language Assessment (DI-ELA) each year from Grade 2 to 5. Math proficiency assessments included a statewide math assessment from the SBAC (SBAC-MA) from Grades 3 to 5 and a District Interim Math Assessment (DI-MA) from Grades 2 to 5. The same students in the dual-immersion group were also given an additional Spanish assessment (Las Links) from Grade 2 to grade 5.
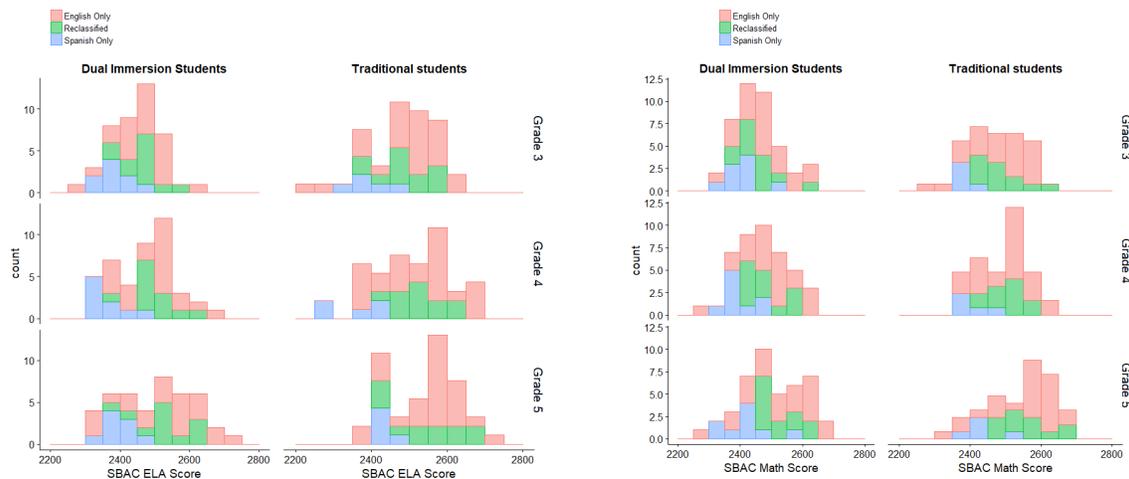
Figure 9. Histograms of each SBAC assessment by the two groups (dual-immersion and traditional) and by English language proficiency (English only, reclassified, and Spanish only).

Histograms of the statewide SBAC exams are shown in Figure 9. Distributions of the scores are shown by the type of class (dual immersion and traditional) and by grade (3-5). The district interim and Las Links exam distributions are found in Figure 10 and were given from Grade 2 to 5. In total, we analyzed the results from 14 assessments given to both groups and an additional four assessments given only to the dual immersion group. These histograms show reasonably normal distributions that meet the assumption required for parametric testing between the dual immersion group and the traditional groups. The EL group is considerably smaller than the EO group with nine and five participants for the dual immersion and traditional classrooms, respectively. Thus, comparisons between the EL group and the reclassified and EO groups need to be qualified with a reminder that while the parametric tests are still valid for small groups, we may not have sufficient statistical power to find significant differences. That is, any comparison

is more likely to encounter a Type II error. A histogram of each Las Links assessment is shown by English language proficiency.
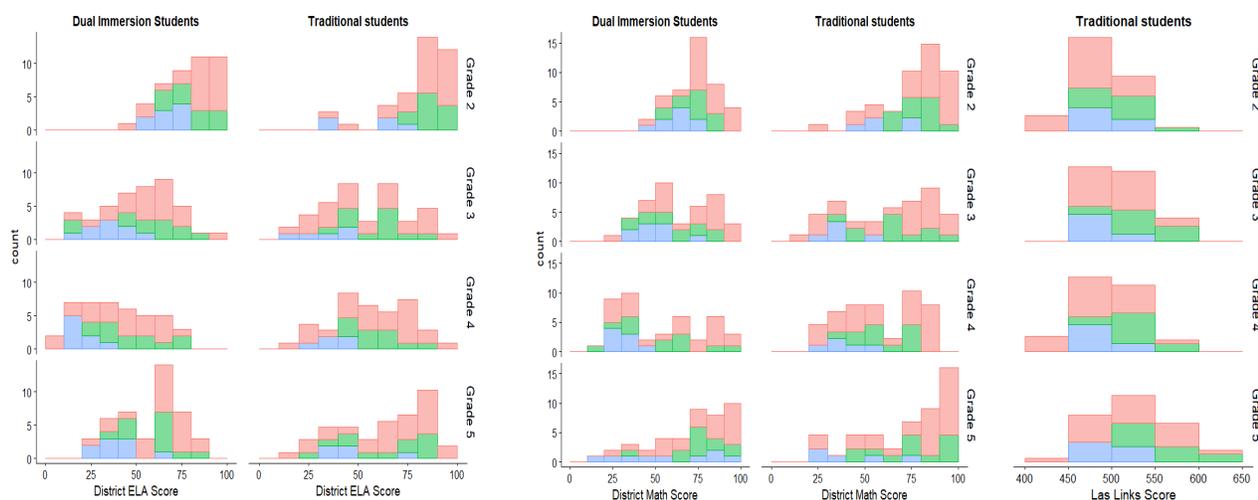

Figure 10. Histograms of each district interim assessment by the two groups dual immersion and traditional (left) and by English language proficiency (English only, reclassified, and Spanish only).

Students were evaluated for ELA and Math at each grade by district interim and statewide exams. These duplicate measures are designed to assess the same construct, and if successful, will be highly correlated with one another. This would indicate high convergent validity or the degree to which two tests will agree with one another. We tested this convergence by running a Pearson correlation between all pairs of relevant exams with a district interim and a statewide component. We found strong positive correlations between district and state ELA scores across Grade 3 (r (83) = .77, p < .001), Grade 4 (r (82) = .87, p < .001), and Grade 5 (r (84) = .79, p < .001). We also found a strong positive correlation between the district interim math exams and the statewide SBAC math exams in Grade 3 (r (80) = .87, p < .001), Grade 4 (r (82) = .89, p < .001), and Grade 5 (r (84) = .76, p < .001). We can be reasonably confident that the statewide SBAC and the interim district exams are measuring the same constructs.

Surprisingly, three students in Grade 5 performed very well on the district interim ELAs, but substandard on the state SBAC ELA exams. This is evident in Figure 11 which shows the three students grouped in the top left of the figure. Such deviations are unexpected and may be an indication that other factors are influencing these scores.
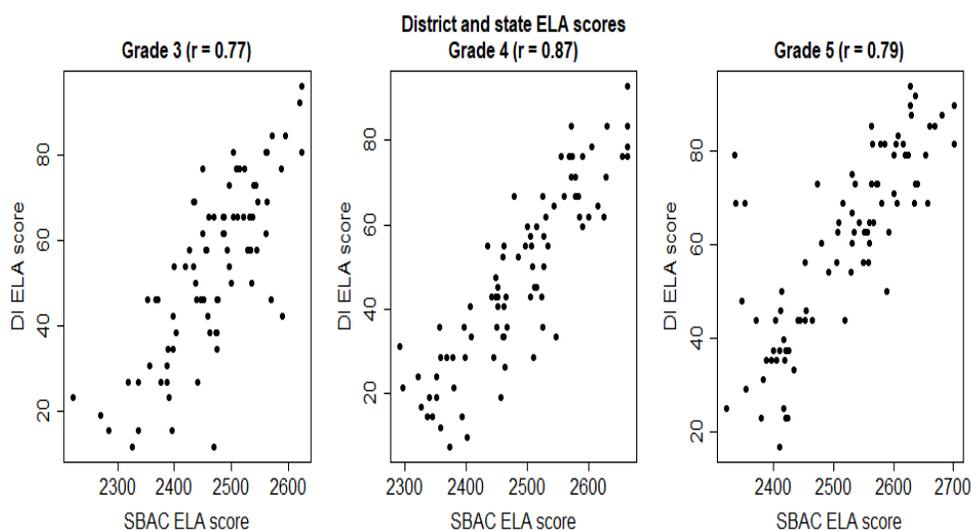
Figure 11. A scatterplot of district interim ELA scores compared with SBAC ELA scores across Grades 3, 4 and 5.

This unusual grouping appears again for math in Grade 5, which indicates poor performance in the state exams but exceptional performance in the district exams (see Figure 12). It is important to note that district exams are developed to align to state exams and to give more validity to a student's performance. Interestingly, the students in the ELA grouping are the same as those in the math grouping. These four students were all part of the dual-immersion program, and all four were in the same classroom in Grade 4 and Grade 5. Thus, we suspect these scores may not reflect the true representation of this group of students at the district-wide level.
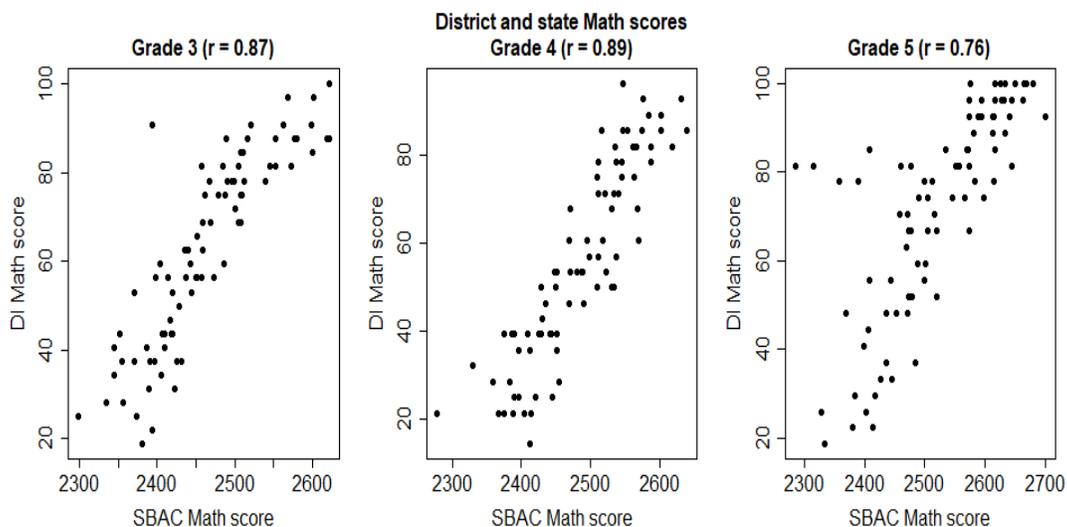
Figure 12. A scatterplot of district interim math scores compared with SBAC math scores across Grades 3, 4 and 5.

Aggregate Score Analysis

An aggregate of standardized scores was used to understand the group level difference between dual immersion students and traditional students across the three language proficient categories. A single performance measure was generated for English language arts (ELA), math assessment, and for dual immersion students, Spanish language. The composite ELA score consisted of all three grades of the SBAC-ELA assessment and all four grades of the DI-ELA assessment. The composite math score consisted of all three grades of the SBAC-MA assessment and all four grades of the DI-MA assessment. Finally, for the composite Spanish score, the three grades of the Las Links assessment were used.

The aggregate scores were created by first standardizing each test. Standardizing the test scores rescales the data to have a mean of 0 and a standard deviation of 1. The standardized values for all relevant assessments were then averaged together in each of the three subject areas. Standardization was necessary for two reasons: First, the range of possible scores in each exam varied from one another and standardizing places them onto the same scale and second, students

are expected to improve from one grade to the next. However, in this analysis, we are not interested in how the students improved over time, but rather how well one group performed relative to another. Averaged standardized scores reveal the performance of each student in each subject relative to one another.

The ELA aggregate scores are plotted in Figure 13 with values in Table 5. These values are grouped by the dual immersion status and language proficiency. A two-way ANOVA was
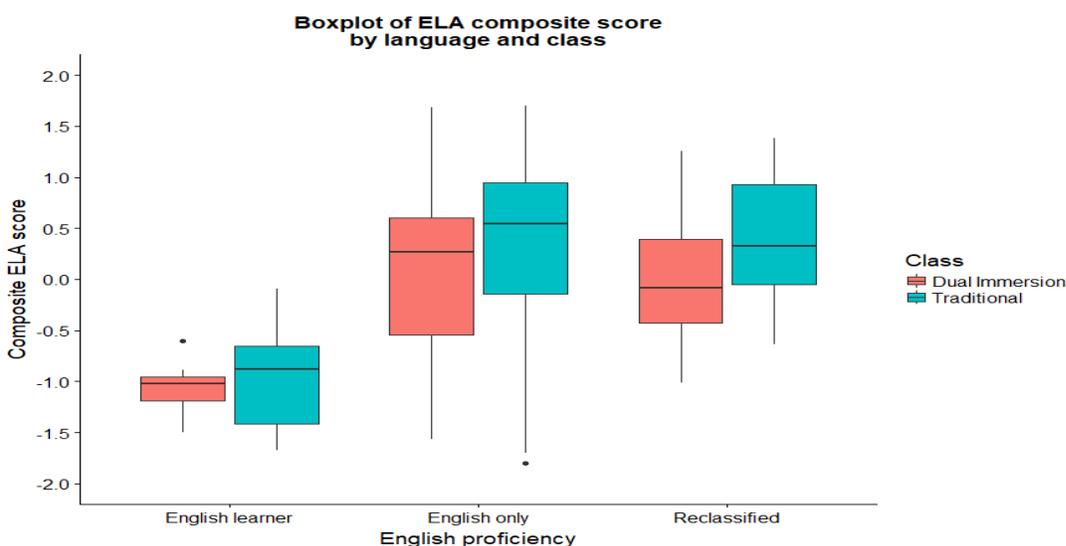
Figure 13. Boxplots of ELA composite score by language and class.

used with *class* as the first factor with two levels (dual-immersion and traditional) and *language proficiency* as the second factor with three levels (English learner, English only, and reclassified). We found a significant main effect for both class ($F (1, 80) = 4.13$, $p = 0.045$) and language proficiency ($F (2, 80) = 12.89$, $p < .001$). The interaction effect was not found to be significant ($p = .92$). A post hoc comparison using Tukey HSD correction found that the English learner group was significantly lower than both the reclassified group ($p < .001$) and the English only group ($p < .001$). Thus, according to the aggregate score analysis, the dual immersion classroom underperformed on ELA when compared with the traditional classrooms.

Additionally, the English learner group scored lower on average on the ELA exams compared to the English only and the reclassified groups.

Table 5

Math Composite Score

Student Category	Class	$\bar{x}$	S
Reclassified	Dual Immersion	-0.02	0.69
	Traditional	0.26	0.67
English only	Dual Immersion	0.16	0.90
	Traditional	0.25	0.96
Spanish only	Dual Immersion	-0.84	0.57
	Traditional	-0.95	0.57

The scores for math are plotted in Figure 14 with values in Table 6, once again these values are grouped by the dual-immersion status as well as the language proficiency. Another two-way ANOVA was run using the same set of factors as the ELA analysis to examine the effect of the dual immersion program and language status on the standardized aggregate math scores. We found a significant main effect for the language proficiency factor (F (2, 80) = 9.31, $p < .001$), but no significant differences between class ($p = .24$) or an interaction effect between class and language proficiency ($p = .79$). A post hoc comparison using Tukey HSD correction indicated that the mean score for the Spanish only group was significantly lower than both the English only ($p < .001$) and the Reclassified groups ($p = .002$). For the Spanish only students, we can expect a lower rate of performance on the math assessments relative to the Reclassified

and English only students regardless of whether they are in the dual immersion or the traditional classroom.
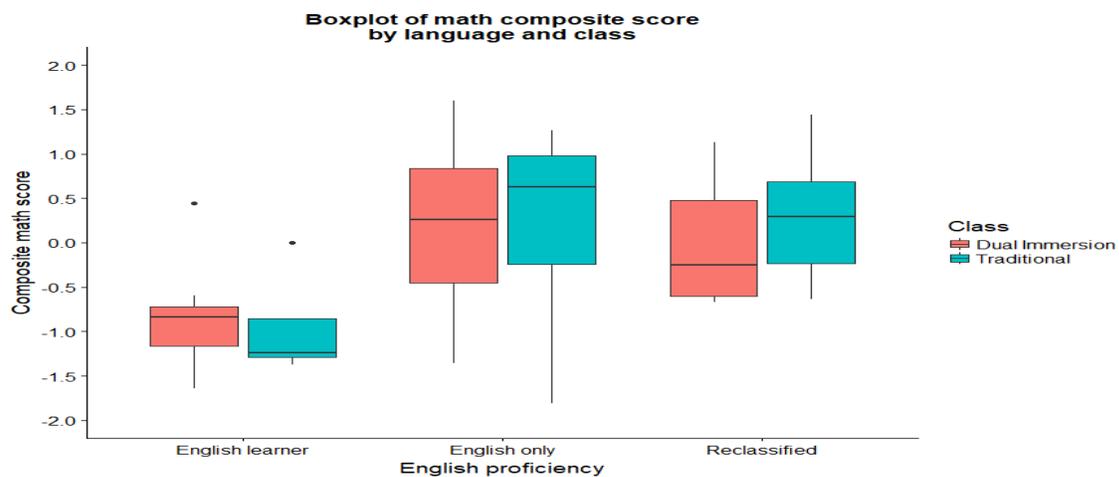
Figure 14. Boxplots of math composite scores by language and class.

Table 6

Spanish Composite Score

Student Category	Class	$\bar{x}$	s
Reclassified	Dual Immersion	0.05	0.66
	Traditional	0.38	0.65
English only	Dual Immersion	0.07	0.81
	Traditional	0.30	0.98
Spanish only	Dual Immersion	-1.05	0.25
	Traditional	-0.94	0.63

Scores for Spanish proficiency were aggregated using Las Links exam scores from Grade 3, 4, and 5 (see Figure 15 and Table 7). Since only the dual immersion group was assessed on Spanish proficiency, we cannot differentiate between the two classes using Spanish. We ran a one-way ANOVA using the language proficiency factor as previously done to measure the effects of English language proficiency on the aggregate Spanish score and found a significant main effect ($F (2, 40) = 5.01$, $p = .012$).
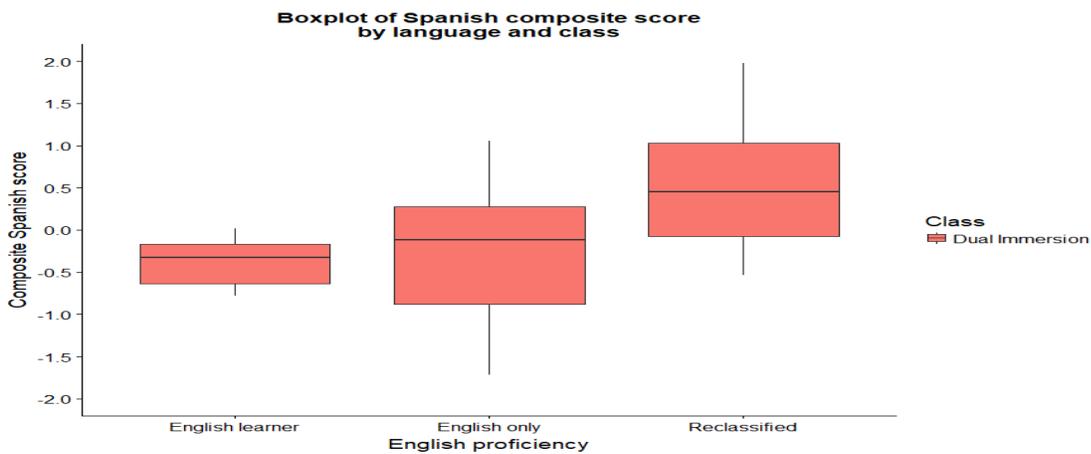
Figure 15. Boxplot of Spanish composite score by language and class.

A post hoc comparison revealed that the reclassified group scored significantly higher on Spanish than both the English only ($p = .025$) and the English learner (.021) groups. Surprisingly, the English learner group scored the lowest across the three groups in a Spanish assessment on average.

Table 7

Spanish Composite Score by Student Group

Student Group	$\bar{x}$	s
Reclassified	0.63	0.89
English only	-0.18	0.94
Spanish only	-0.40	0.30

The relationship between each measure may suggest potential latent factors. High student performance in ELA, Spanish, and math may be due to an underlying performance that is shared across subject areas. A Pearson correlation (see Figure 16) indicated a significant positive relationship between all three aggregate scores: ELA and math ($r (84) = .88, p < .001$), ELA and Spanish ($r (41) = .72, p < .001$), and math and Spanish ($r (41) = .59, p < .001$).
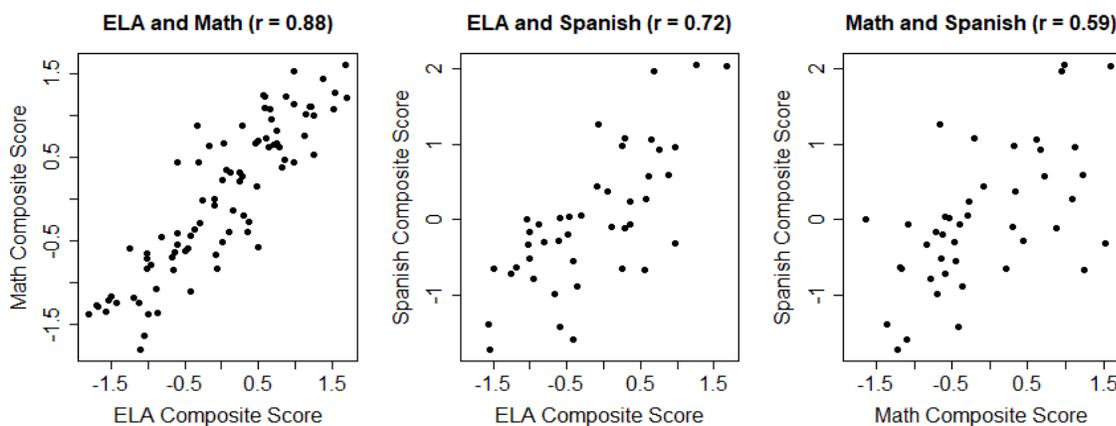
Figure 16. A scatterplot across each combination of aggregate standardized scores.

The correlations including the Spanish scores are compared only within the dual immersion group. Strong correlations between ELA, math, and Spanish support the notion of a latent measure that is shared across the subjects, possibly a measure of intelligence or aptitude for education. Students performing well in one subject are expected to perform well in the others.

A central question to the efficacy of the dual-immersion program is the effect it has on subject level proficiency. Indeed, we have found that scores on the ELA exam are on average lower in the dual-immersion program when compared with the traditional classroom with an effect size of .172 standardized units. This same effect was not found to be statistically significant for the aggregate math scores. While the composite score analysis is helpful in discerning the general differences in ELA and math scores, it is underpowered to detect more subtle changes across grade levels. We introduce a longitudinal model to account for effects of time on the score of each assessment and to improve the statistical power in testing the difference between the dual immersion class and the traditional class.

Longitudinal Analysis

The primary aim of this study is to identify the effects of the dual immersion program on student education. To avoid issues of multicollinearity due to highly correlated test measures, each assessment was modeled separately from one another. The raw scores were again converted to standardized values, but without aggregation. A consequence of standardizing each grade is that any effect of grade will be effectively eliminated. For example, any score increase across grade will be relative to each group and not due to the expected increase due to advancing education. Indeed, since assessments at each grade increase in difficulty to accommodate more

advanced subject material, we cannot make any statistical claims towards an increasing (or

decreasing) subject level ability except when comparing across factors.

We are interested not only in the average difference across categories, but also the change

in relative performance over time, represented here as a grade factor. All assessments will use

the same analysis of response profiles model with grade, class, EL status and gender as

covariates. We also include as predictors the interaction effects within grade, class and EL

status. Since each grade is defined as a separate regressor, the interaction effects can inform

which factors are significantly different at each grade level, a feature not available in the

aggregate analysis. Since the aggregate analysis found no differences between the English only

and reclassified category, we chose to increase power by further combining these two categories

into an "English proficient" category of students that have mastered English to CELDT

standards. The following model will be used for both the district interim ELA and math

analysis:

$$y_{ij} = \beta_0 + \beta_1 G_3 + \beta_2 G_4 + \beta_3 G_5 + \beta_4 T + \beta_5 E + \beta_6 F + \beta_7 G_3 T + \beta_8 G_4 T + \beta_9 G_5 T + \beta_{10} G_3 E + \beta_{11} G_4 E + \beta_{12} G_5 E + \varepsilon_{ij}$$

$$\varepsilon \sim N(0, \sigma_\varepsilon^2) \qquad\qquad G_{ij} = \{1 \text{ for observation at grade } j; 0 \text{ otherwise}\}$$

In this model G is defined for each observed grade indexed by j, where students are

indexed by i. T is used as an indicator variable for students that are in the traditional class with

the dual immersion class acting as reference. E represents the English proficient group with

English learners as the reference. F represents the female students with male students as the

reference. We will focus primarily on $\beta_4, \beta_7, \beta_8,$ and β_9 as this represents the effect of the dual

immersion program on students relative to traditional classes. As a secondary aim, we are

interested in the effects of English proficiency on test scores, this will use $\beta_5, \beta_{10}, \beta_{11},$ and β_{12}.

Finally, we will look at any effects of gender with β_6.

District ELA

The district ELA exam was given to students in Grades 2 to 5. The average raw scores of each grade across the four groups are seen in Figure 17. In practice, the raw scores from each exam are converted to a categorical level to indicate the proficiency that a student has in ELA. The levels range from one to four and are indicated in the figure by color (red = 1, yellow = 2, green = 3, and blue = 4).
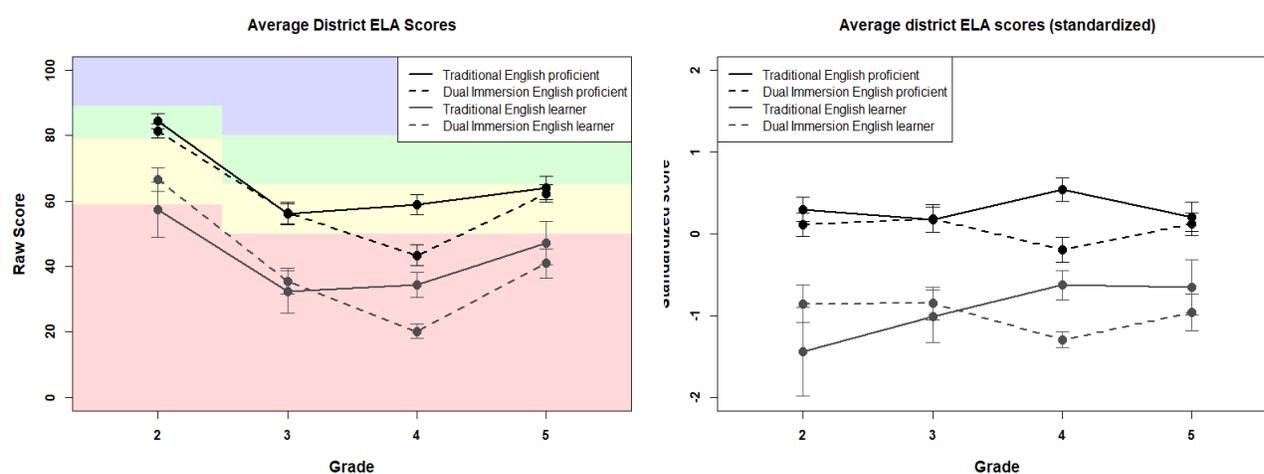
Figure 17. Average district ELA scores (left) and average standardized district ELA scores (right).

Solid lines represent the traditional group, and dotted lines represent the dual immersion program. Black lines are students in the English proficient category, and the grey lines represent English learners. We can observe that, on average, English proficient students are performing between Levels 2 and 3 most of the time, but in Grade 4 the average level for English proficient students enrolled in the dual immersion program was Level 1. Students in the English learner group performed mostly at Level 1 with the exception of the dual immersion students in Grade 2 who performed at an average level of 2. Error bars represent 1 standard error. Figure 17 represents the same data before and after standardization. The flattening of the time course at Grade 2 is representative of this procedure.

Our primary aim is a comparison of the dual immersion classroom and the traditional classroom in effective ELA education. However, the analysis of response profiles found no significant effects of the classroom on district ELA score except for a significant interaction between Grade 4 and classroom ($p < .001$). The magnitude of this effect was 0.66 standard deviations, meaning that students enrolled in the dual immersion program scored lower than the students in the traditional classroom controlling for language proficiency. As expected, there were no main effects of Grades 3 to 5 ($p = .381, p = .230, p = .419$ respectively), with respect to the reference Grade 2. We found a significant main effect for English language status ($p < .001$) with a large effect of 1.25 standard deviations. That is, English proficient students perform significantly better on the district interim ELA assessments than the students categorized as English learners. No interaction effects between grade and English language status was found for Grades 3 to 5 ($p = .472, p = .480, p =.289$, respectively) with respect to Grade 2. Finally, a main effect was found for gender ($p = .014$) with an effect of .39 standard deviations. This indicates that, on average, the performance of the female students was higher relative to the male students.

Model evaluations were carried out to confirm model building assumptions. Residuals were visually inspected to confirm homoskedasticity and normally distributed errors. A generalized variance-inflation factor for each covariate also showed no signs of multi-collinearity.

District Math

Students were evaluated in the district interim math assessment from Grades 2 to 5. The average raw scores of each grade across the four groups are seen in Figure 17 (left). Similar to the district ELA scoring system, the math section is scored using the same binning to create

levels. Solid lines again represent the traditional class with dotted lines for the dual immersion class. Black lines are students are in the English proficient category, and grey lines are English learners. Average English proficient student scores were classified in the Levels 2 to 3 range across all four grade levels. English learner student scores were again found to be averaged between Level 1 and 2. Figure 18 shows the district interim math scores after standardization. The apparent large deviations across grade in the English learner group is indicative of the small sample size reflected in the larger standard error bars compared with the English proficient group.
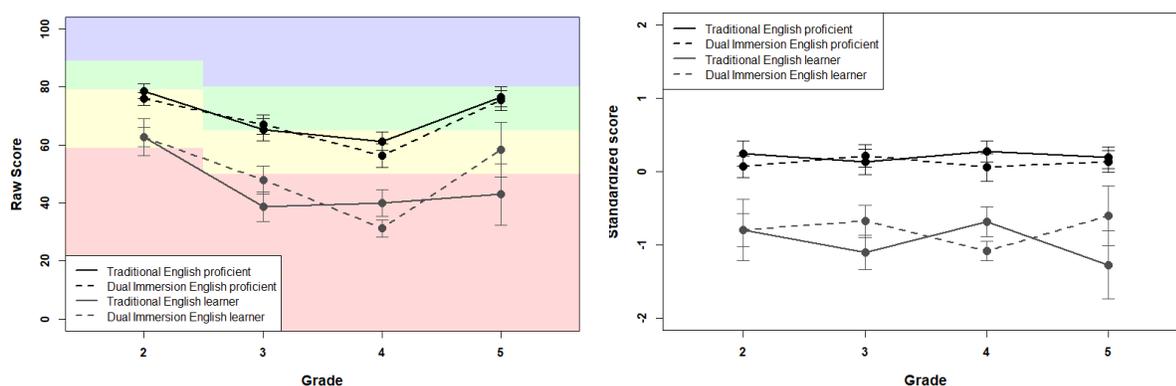
Figure 18. Average district math scores(left) and average standardized district math scores (right).

We found no significant difference between the dual immersion class as compared with the traditional class ($p = .481$). Additionally, no significant interaction between Grades 3 to 5 were found with respect to the dual-immersion factor ($p = .120, p = .535, p = .222$) using Grade 2 as a reference category. We found a significant main effect for English proficiency ($p < .001$) but none for the interaction between grade and English proficiency across Grades 3 to 5 ($p = .605, p = 561, p = .717$). Students in the English proficient group performed an average of .93 standard deviations higher than the English learner group. Finally, we did not find any significant differences for any main effect of Grade 3 to 5 with respect to the reference Grade 2

($p = .777$, $p = .438$, $p = .883$) or gender ($p = .680$). Model evaluations reasonably confirmed the assumptions of the analysis of the response profile model used.

SBAC ELA

Since the SBAC exams were not given to students in Grade 2 we modified the model to remove these coefficients and relevant interactions:

$$y_{ij} = \beta_0 + \beta_1 G_4 + \beta_2 G_5 + \beta_3 T + \beta_4 E + \beta_5 F + \beta_6 G_4 T + \beta_7 G_5 T + \beta_8 G_4 E + \beta_9 G_5 E + \varepsilon_{ij}$$

$$\varepsilon \sim N(0, \sigma_\varepsilon^2) \qquad\qquad G_{ij} = \{1 \text{ for observation at grade j; 0 otherwise}\}$$

The SBAC ELA assessment was given to students in Grades 3 to 5. Averaged raw scores show an upward linear trend for English proficient students (see Figure 19). However, since these assessments were different from one another, this should not be used to evaluate student performance across grades (since the same raw score on a more difficult exam will itself be an indication of learning). A level system was again used to bin raw scores to rate students in one of four categories. Since the raw scoring system is different, different category boundaries were used. An orange diamond at each grade represents the state average score for that grade[1]. English language status and dual immersion category lines are the same as those used in the district interim figures. The average English proficient group score was consistently within the Level 3 category regardless of whether they are in the dual immersion class or the traditional class. The English learner student average scores are within Level 2 for Grade 3 and drop to Level 1 for Grades 4 and 5. After standardization the apparent increase across grade disappears and we can begin to compare relationships between groups (Figure 19).

We expect the SBAC ELA assessment to be related to the district interim ELA as they are designed to measure the same skills. Consistent with all district interim results, we found no

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[1] Retrieved from http://www.smarterbalanced.org/assessments/development/percentiles/

significant main effect for the dual immersion class relative to the traditional class ($p = .211$) as well as no significant interaction effects between the Grades 4 to 5 and the dual immersion status compared with the reference Grade 3 ($p = .796$ and $p = .824$). Additionally, we found a significant main effect for English proficiency ($p < .001$) with an effect size of 1.02. This result is not surprising considering the district interim findings. It indicates that on average English proficient students score one standard deviation higher than English learner students in the SBAC ELA assessment. There was also a significant interaction effect between grade and English proficiency at Grade 4 relative to Grade 3 ($p = .010$) but not present at Grade 5 ($p = .241$). A significant main effect for Grade 4 was found ($p = .021$) but not for Grade 5 ($p = .293$). Finally, a significant main effect for gender was found ($p = .451$) and with a similar magnitude to the district interim ELA model and with a 0.45 standard deviation. We can be reasonably confident that, when controlling for grade, dual immersion status, English proficiency status, and relevant interactions with grade, on average female students outperform male students in ELA.
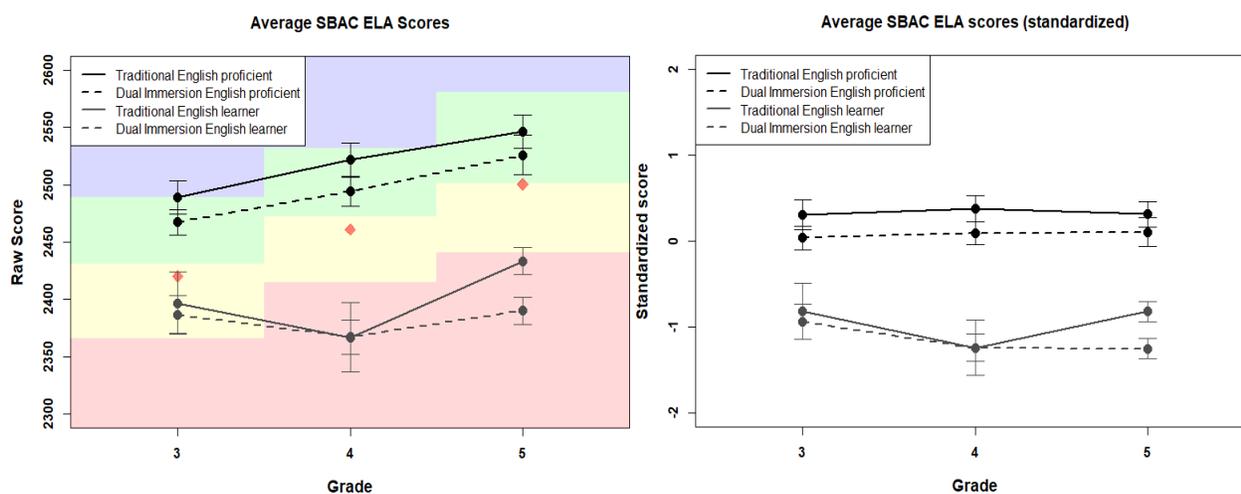
Figure 19. Average SBAC ELA scores (left) and standardized SBAC ELA scores (right)

SBAC Math

The SBAC math assessment was also given to students in Grades 3 to 5. Averaged raw scores once again show an upward linear trend for English proficient students but were relatively flat for English learners (see Figure 20). Similar to ELA, the English proficient students' average fell within the Level 3 category for math while English learner students' average fell around Level 1 in Grade 3 and then Level 2 for Grades 4 and 5. This is regardless of which class they were in. Standardized assessment scores once again flatten the effect of grade but maintain relationships between categories (see Figure 20).

The SBAC math assessments are expected to measure the same skillset as the district interim math assessments, and so we hypothesized similar findings. Indeed, we found an identical pattern of significant effects with a close similarity in effect size. For the primary aim, we found no significant effect of the dual immersion group on the standardized scores ($p = .570$) or an interaction effect between the dual immersion group and Grades 4 to 5 ($p = .899$ and $p = .268$). A significant effect of English proficiency was found ($p = .001$) with an effect size of 0.96 standard deviations. The interactions between Grades 4 to 5 and English proficiency were not found to be significant ($p = .255$, $p = .229$) relative to Grade 3. Main effects for Grades 4 to 5 ($p = .252$, $p = .112$) and gender were also not found to be significant ($p = .527$).
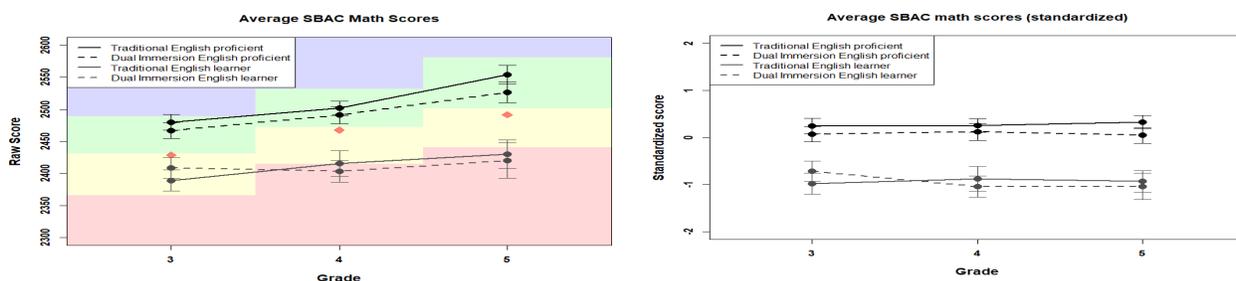
Figure 20. Average SBAC math scores (left) and average SBAC math standardized scores (right).

Spanish Proficiency Analysis

The Spanish proficiency evaluations warrant a new model parameterization for the following reasons. First, Spanish proficiency was only evaluated within the dual immersion program, and so we removed the students that were in the traditional classrooms. Second, the aggregate score analysis showed significant differences between the reclassified group and both the English only and the English learner groups. Since there is no logical grouping between English only and English learners, we reverted back to three groups for this analysis: English learners, reclassified, and English only. The following model was used:

$$y_{ij} = \beta_0 + \beta_1 G_3 + \beta_2 G_4 + \beta_3 G_5 + \beta_4 E + \beta_5 R + \beta_6 F + \beta_7 G_3 E + \beta_8 G_4 E + \beta_9 G_5 E + \beta_{10} G_3 R + \beta_{11} G_4 R + \beta$$

$$_{12} G_5 R + \varepsilon_{ij}$$

$$\varepsilon \sim N(0, \sigma_\varepsilon^2) \qquad\qquad G_{ij} = \{1 \text{ for observation at grade j}; 0 \text{ otherwise}\}$$

Where G again represented the grade at levels indexed by j and individual students indexed by i. E is used for the English only group and R for the reclassified group relative to the reference group of English learners.

Our primary aim, to compare the effects of a dual immersion program on students, could not directly be tested using Spanish proficiency. However, it was reasonable to assume that students in the traditional classrooms were not learning Spanish from class instruction. With this assumption in mind, any increase in Spanish proficiency across the course of this study would likely be a result of the dual immersion program. Additionally, we were interested in how the English proficient categories compared with one another. Figure 21 shows the time course of every dual immersion student grouped by English status as well as the averages and standard error in these groups for raw (left) and standardized values (right). Red represents the English only group, blue the English learner group, and purple is the reclassified group.

We found a significant main effect for Grade 3 ($p = .020$) and Grade 5 ($p = .008$) but not for Grade 4 ($p = .182$). No significant effect for English only ($p = .378$) or reclassified ($p = .467$) was found when compared to the reference group of English learners. We found a significant interaction between Grades 3 and 5 for both the English only ($p = .030$ and $p = .008$) and the reclassified ($p = .007$ and $p = .004$) groups. On average, students in the English only group outperformed English learner students in Grade 3 by 0.53 standard deviations and students in Grade 5 by 0.73 standard deviations. Additionally, the students in the English reclassified group outperformed English learner students in Grade 3 by 0.73 standard deviations and students in Grade 5 by 0.86 standard deviations. We also found a significant effect for female students ($p = .005$) who scored 0.67 standard deviations higher than male students.

The Spanish proficiency examinations (Las Links) revealed a trend that was not found in the ELA or Math examinations. As reported previously, reclassified students (RFEP and IFEP) were not found to be significantly different from English only students in the Math and ELA examinations. The reclassified students did consistently outperform English learner students in Spanish proficiency. However, this trend appeared to be due to an initial difference between the groups at the start of Grade 2, the difference in the trend of Spanish acquisition is not significant and indeed appeared to follow the same pattern over time (see Figure 21).

The early difference in Spanish proficiency may be attributable to greater familiarity with the language for reclassified students. This edge seems to follow them throughout the program but does not grow wider.
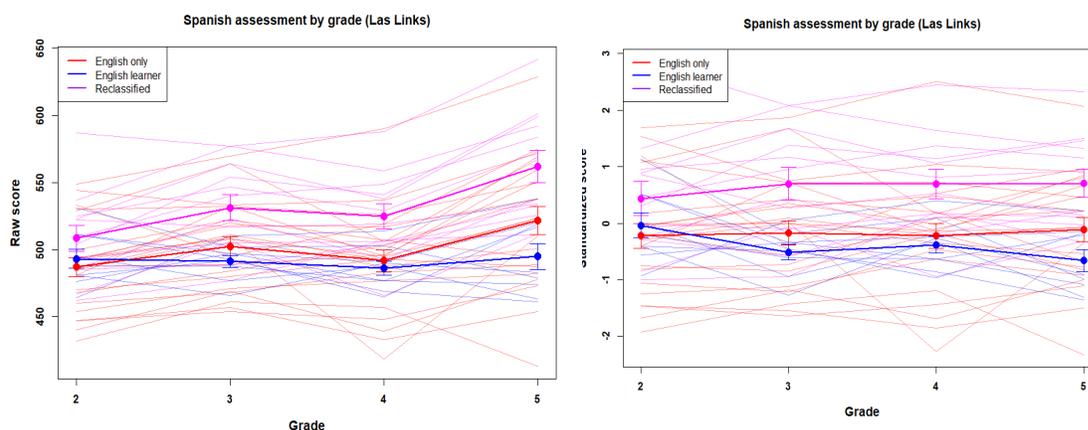
Figure 21. Spanish assessment raw score (left) and standardized score (right) for LAS Link

Student Survey

What has the Two-Way Spanish-English Dual Immersion Program provided you?

The interrater reliability was carried out through investigative analysis that involved the scoring of the participant instruments, creating categorized interrater reliability based on emerging themes for this question such as language acquisition, better education, better future job, language application, appreciate others, and parent choice. The highest rated reason of what the program provided students was language acquisition with 71% ($n = 29$) of the total number of responses ($n = 41$) falling under the language acquisition theme. The second highest rated reason for what the program provided students was better education with 22% ($n = 9$) of the responses falling under the better education theme.

Did you know you were participating in a specialized program?

When responding to whether or not a student knew they were participating in a specialized program, 95% ($n = 39$) of the responses ($n = 41$ responses) confirmed that they knew they were part of a specialized dual immersion program.

Did you know you were participating in a specialized program? Why?

The interrater reliability was done through investigative analysis that involved the scoring of the participant instruments, creating categorized interrater reliability based on emerging themes for this question such as parents, teachers, on my own, tested in, and unaware. The highest rated reason for how they knew they were part of a specialized program was, in 56% ($n =$ 23) of the responses ($n = 41$), came from the teachers explaining it to the students. The second highest rated reason for how they knew they were part of a specialized program was, in 39% ($n = 16$) of the responses, from the teachers explaining it to the students.

Do you have any specific emotions about being part of a specialized program? Why?

The interrater reliability was done through investigative analysis that involved the scoring of the participant instruments, creating categorized interrater reliability based on emerging themes for this question such as positive emotions, challenge, indifferent, none reported, waste of time, and stressed. The highest rated reason by an overwhelming margin was in 73% ($n = 30$) of the total number of responses ($n = 41$), from the students sharing positive emotions towards the program.

Have your grades improved since you have been part of this program?

When responding to whether their grades had improved since participating in the program, 54% ($n = 22$) of the responses ($n = 41$) showed that participants were *neutral* when deciding if the program had helped to improve their grades, 36% of the respondents ($n = 15$) shared that they were in between, *neutral* and *completely agreeing,* that the program improved their grades, and only 5% of the respondents ($n = 2$) expressed that they completely agree that the program had improved their grades. Having only 2% share that the program is improving their grades is an outstandingly low awareness. As an educator, the researcher hopes that, in the

future, there would be more effort by the teachers and parents to show the students the evidence of gains in improved grades.

My learning of another language has improved in the dual immersion program.

When responding to whether each student had improved on learning another language since participating in the program, a resounding 63% of the responses ($n = 26$) out of the total numbers of responses ($n = 41$) showed that participants *completely agree* that they have been improving in learning another language with 27% ($n = 11$ out of 41 responses) falling right below the *completely agree* category. The researcher found it is ironic that when over half of the students fell in the *neutral category* regarding if the program improved their grades yet more than half still feel that they are completely learning another language.

Why do you think your language has improved since you have been in the dual immersion program?

When responding to why students think they have improved on learning another language, 63% ($n = 26$) of the responses ($n = 41$) indicated that it was due to the fact that students could speak, read, and write in both English and Spanish and 24% of the responses ($n = 10$) stated that it was due to the fact that students had the ability to communicate with and understand others such as friends and family. This information is evident that students not only could learn to speak, read, and write in another language but they could also apply it to their everyday life by having conversations with family and community members.

Parent Survey

My relation to the student in the Two-Way Spanish-English Dual Immersion Program is.

When responding to the question about the child's relationship with the interviewee, 63% ($n = 6$) of the responses ($n = 41$) highlighted that the respondents were the mother of a child in the dual immersion program.

What are the reasons/motivations for enrolling your child into the Two-Way Spanish-English Dual Immersion Program?

The interrater reliability was done through investigative analysis with the scoring of the participant instruments, creating categorized interrater reliability with emerging themes for this question such as language acquisition, language application, future success, better education, cultural understanding, and job prospects. The highest rated reason for putting their child in a dual immersion program was language application with 48% ($n = 13$) of the total responses ($n = 27$) in the language application theme so the child could be bi-literate and bilingual. The second highest rated reason for putting their child in a dual immersion program was for future success with 41% of the responses in the *future success* theme ($n = 11$) so the child would either go to college or it would prepare them for job opportunities.

Predominant language spoken in household is.

When responding to what predominant language was spoken in the household, 41% ($n = 14$) of the responses ($n = 34$) were English, 29% ($n = 10$) of the responses were Spanish, and 26% ($n = 9$) of the responses were English and Spanish.

How do you help and support your child to become bilingual?

When parents responded to how they support their child in becoming bilingual, the interrater reliability process yielded emerging themes such as homework, practice reading in

Spanish, communication in Spanish, culture events, television/movies, and motivation. Communication in Spanish constituted 67% (*n* = 18) of the parent responses (*n* = 27), which was the highest rated theme so that the children could speak to grandparents and other family members living in another country. The second highest rated theme constituting 52% (*n* = 14) of the responses was *practicing reading in Spanish*.

How do you help and support your child to become bi-literate?

When parents responded to how they support their child in becoming bi-literate, the interrater reliability process produced emerging themes such as parent and family support, books, movies, and audios, outside technology sources, teacher support, and practice. Parent and family support had 52% (*n* = 12) of the parent responses (*n* = 23), which was the highest rated theme. The second highest rated theme with 35% (*n* = 8) of the responses was becoming bi-literate through books, movies, and audios.

As a parent of a child that has participated in this program since kindergarten, how has parent involvement increased/changed over the past six years with the dual immersion program?

When responding to whether parent involvement has increased over the course of the program since its inception, a resounding 66% (*n* = 19) of the responding parents (*n* = 29) indicated that there had been an increase in parent involvement at the school.

What is your race/ethnicity?

When responding to the race and ethnicity question, 72% (*n* = 21) of the respondents answered that they were Hispanic, 21% (*n* = 6) of the respondents answered that they were White, and 7% (*n* = 2) indicated that they were Vietnamese. There were 12 surveys in which this answer had been left blank.

What is your level of education that you have completed?

When responding to parent education level, 49% ($n = 18$) of the parents ($n = 37$) marked that they completed bachelor's degree or higher, 35% ($n = 13$) of the parents ($n = 37$) marked that they completed high school, 11% ($n = 4$) of the parents marked that they had completed some high school, and only 5% ($n = 2$) of the parent responses indicated that they had completed elementary school or below.

What is gross annual home income?

When responding to the annual home income level question, 57% ($n = 12$) of the total number of parent responses ($n = 21$) marked that the annual home income was above $50,000 while 43% ($n = 9$) of the parent responses marked the annual income was below $50,000. There were significant number of surveys ($n = 20$) that had this answer blank.

The Two-Way Spanish-English Dual Immersion Program is effective for my child.

When responding to the program and if it was effective for their child, an overwhelming 97% ($n = 28$) of the parent respondents ($n = 29$) marked that the program was highly effective or effective. There was only one survey that marked the program was a little effective with no surveys declaring that the program was not effective.

My child's learning another language in the Two-Way Spanish-English Dual Immersion Program has improved.

When responding about whether their child had improved on learning another language, thanks to the program, an overwhelming 97% ($n = 28$) of the parent respondents ($n = 29$) marked that their child has improved in learning another language.

Teacher Survey

How many years have you been teaching in education?

When teachers responded to how long they have been teaching in education, 85% (*n* = 11) of the total number of responses (*n* = 13) shared that they had been teaching in education between 4 to 15 years. Only 15% (*n* = 2) of the teachers had been teaching less than four years.

How many years have you been teaching in a dual immersion program?

When teachers responded to how long they have been teaching in in a dual immersion program, only 62% (*n* = 8) of the responses (*n* = 13) shared that they had been teaching in a dual immersion program between 4 to 15 years while 38% (*n* = 5) of the teachers had been teaching in a dual immersion program less than four years.

Explain how curriculum has played a part in the instruction of two languages.

The interrater reliability was done through investigative analysis through the scoring of the participant instruments, creating categorized interrater reliability with emerging themes for this question such as researched-based curriculum, support staff, successful program, supplemental program, and insufficient curriculum. The highest rated reason for why curriculum played a part in the instruction of two languages was, in 85% of the teacher responses due to quality research-based curriculum.

Have you experienced any challenges specific to this program? If so, how did they overcome these challenges?

When teachers responded to the question about the challenges they face specific to the dual immersion program, the interrater reliability was determined by finding common emerging themes such as lack of district support, lack of administrator support, lack of resources, student ratio, enrichment resources and activities, curriculum and model change, and encouraging

students. Lack of resources appeared in 77% ($n = 10$) of the teacher responses ($n = 13$), which was the highest rated theme.

I have been supported by school and district personnel with the dual immersion program.

When responding to whether teachers felt supported by the school and district personnel respectively to the dual immersion program, 23% ($n = 3$) of the responses ($n = 13$) shared that they completely agree that they have been supported by the school and district personnel with 62% ($n = 8$) falling right below the *completely agree* category but above the *neutral* response. This means that 85% of the teachers in the dual immersion program feel supported by the school and district personnel in some way.

What support have you received from your school?

When teachers responded to how they have been supported, the interrater reliability with process yielded emerging themes such as collaboration, supplemental materials, training and conferences, administrator support, and curriculum. Training and conferences made up 85% ($n = 11$) of the teacher responses ($n = 13$), which was the highest rated theme. The second highest rated theme, collaboration, had 77% ($n = 10$) of the teacher responses.

What additional supports do you need?

When teachers responded to how they have been supported, the interrater reliability with emerging themes was formed such as collaboration, program evaluation, training and conferences, and interventions. Interventions for the dual immersion program had 54% ($n = 7$) of the teacher responses ($n = 13$), which was the highest rated theme. The second highest rated theme, collaboration, was made up by 38% ($n = 5$) of the teacher responses.

Students' learning of another language in the Two-Way Spanish-English Dual Immersion Program has improved.

When responding to whether teachers felt that students were improving in learning another language, 23% ($n = 3$) of the responses ($n = 13$) shared that they completely agree that students were improving in learning another language with 46% ($n = 6$) falling right below the *completely agree* category but above the *neutral* response. This means that 69% ($n = 9$) of the teachers ($n = 13$) in the dual immersion program feel students are improving in some way on learning another language.

CHAPTER 5: DISCUSSION AND IMPLICATIONS

Introduction

In the preceding chapter, the presentation and analysis of data have been reported. Chapter 5 consists of a summary of the study, conclusions and limitations and recommendations for further research.

Summary of the Study

This chapter begins with a summary of the purpose and structure of the study and is followed by the major findings related to the academic effects of an elementary Two-Way Spanish-English Dual Immersion program between dual immersion students and non-dual immersion students. This study supports previous data research on Two-Way Spanish-English Dual Immersion programs being most beneficial for English learners' academic achievement (Lindholm-Leary, 2001). This study and previous research display that bilingual students participating in a Two-Way Spanish-English Dual Immersion program academically outperform or score as well as their peers who are monolingual (Lindholm-Leary, 2001).

Conclusions and Limitations

The primary aim of this study is to evaluate differences between students in the dual-immersion class and students within the traditional class. The study was aimed at answering the following research questions:

1. What are the performance scores in language arts and mathematics standardized tests of students in a Two-Way Bilingual Immersion instruction?

2. In what ways do the scores on standardized tests with students in a Two-Way Bilingual Immersion program compare to monolingual English-speaking students in an English Language Mainstream program?

To this end, we assessed student performance in ELA and math in both groups across district and state exams. District exams were given each year for Grades 2 through 5 and state exams were given each year for Grades 3 to 5. We first aggregated all standardized scores across ELA assessments and found a significant effect between the dual immersion and traditional classes. This same effect was not found with the math aggregate analysis. Further, an analysis of response profiles for ELA in both district interim and SBAC exams revealed a significant effect of class for only one interaction at Grade 4 in the district interim ELA exam. An analysis of response profiles for math in both district interim and SBAC exams found no effect of dual immersion relative to traditional classrooms. These findings together make a positive effect of dual immersion on ELA and math between Grades 2 to 5 unlikely. Indeed, the trends of most non-significant tests were found to be negative. That is, on average, students in the dual-immersion group averaged lower scores in ELA and math. In the literature, there are several reports of the positive impact of dual-immersion classes not taking place until after Grade 5 (Steele et al., 2015; Umansky, Valentino, & Reardon, 2015; Valentino & Reardon, 2015). Short-term negative effects in the dual immersion program may be made up for with a long-term positive effect. It is apparent that additional work is needed to continue testing students past Grade 5. It would thus be beneficial to include further evaluations through secondary education.

It is not unreasonable to assume that instruction in another language, unfamiliar to some, will impact the growth of student performance in ELA and math. However, this expense is small, potentially short term and comes with the benefit of gaining familiarity with another language. For the English only group and the reclassified group it appears that this is the case, we see improvement on Spanish proficiency exams without a significant sacrifice on ELA or math. Interestingly, the English learner group, or students that were not reclassified as English

proficient, performed the worst overall on the Las Links Spanish proficiency exams. Additionally, this group failed to improve Spanish proficiency over the course of the program. This counterintuitive result might be attributed to a selection bias. Reclassified students are removed from the English Learner group, and what is left are students that may struggle not only with English, but also in their native Spanish. It is not surprising then to see this group of struggling students performing poorly in ELA, Spanish, and Math assessments. If this finding is replicable, English learner students will have a more difficult time in the dual immersion class and may be better served in a traditional classroom. English learners were found to be right below the mean as their peers in the program were at the mean, which aligns with current and past research that students in a dual language program will meet or exceed their monolingual peers at or by the fifth grade.

Another primary aim of this study is to evaluate differences between the dual immersion class and the traditional class through student, parent, and teacher surveys. The study was aimed at answering the third research question: How do students, parents, and teachers interpret their experience in the dual immersion program? Themes emerged from the study such as motivations and substance that the Two-Way Spanish-English Dual Immersion Program has provided students, which aligns with what parents sought out in having their child participate in this type of dual language program.

Parents wanted their children to be able to have language applications where they could communicate with family members and to be able to use this as a means to future success in education and job opportunities. Student goals were to acquire a second language and use it to better their education.

Another aspect founded in the study is that parent involvement was not only increasing but that parents found it to be important in their child's education. In this study, the predominant language spoken at home was English, yet the responding surveys were mainly from a Hispanic household.

Examination of annual home income level shoed that 57% of our families lived in a household with an income level of more than $50,000 which was an interesting since the program was carried out at a school in a low socio-economically disadvantaged area. Achievement data shows that students who have teachers from similar ethnic and socio-economic backgrounds as themselves perform better than students who have teachers from different ethnic and socioeconomic backgrounds (Viadero, 2008).

A high percentage of (85%) teachers in the dual immersion program have been teaching in the educational field between 4 to 15 years. Thirty-eight percent of teachers, another high percentage, have only been teaching in the dual immersion program less than four years. The researcher would hope to see, as the program progresses, and the stability of teacher mobility sets, an even higher increase in student achievement due to teacher experience.

Challenges that were apparent and emerged from the surveys is that teachers felt they needed more administrator support, supplemental materials and interventions, time to collaborate with their colleagues, and time to evaluate the program. When asked the question of whether or not students were increasing in learning another language, the students, parents, and teachers shared that students were definitely progressing in learning another language. Muhammad (2012) explains that, "Educator's socialization plays a major role in their view of how the school should operate and whether or not they believe all students, or a particular group of students will succeed academically" (p.3).

Recommendations for Further Research

The goal of this study was to investigate the major findings related to the academic effects of an elementary Two-Way Spanish-English Dual Immersion program between dual immersion students and non-dual immersion students. Data was collected to test three research questions relating to this goal. The information was studied, and many significant findings resulted from the examination of the data.

The data can only conclude that students are at or getting close to the mean score of their fifth-grade monolingual peers and a further study at the end of their middle school years should be conducted to evaluate the student achievement successes at that time. Currently, the data provided only suggests that the program is doing what research says it will provide in academic student achievement. It does not suggest that this program has surpassed or made significant gains compared to the monolingual peers.

Another apparent conclusion of the study is that teachers need more stability in this program that will come with the age of the program. The program itself is early on in its stage of inception. It only reached its maximum capacity up to the sixth-grade level this year. Since new teachers are hired each year to fill the new grade level that was being added to the program as it was being implemented, data should be different as the latter grade level teachers have more years of experience instructing at their grade level.

It is also concluded that since the program is in its infant stages of implementation that teachers be given more professional development surrounding second language learners and best strategies to teacher them. They should also be provided with supplemental materials that are most effective for children learning two languages and be included in interventions that best serve students participating in a dual immersion program.

The last recommendation is to review the process of constructing and developing each classroom makeup. The program needs to evolve over the years with student ratio as equal as possible in gender, home language, and English learner status.

The study contributes to the bilingual education program field and models, specifically the dual immersion programs. The data substantiate that bilingual education develops biliteracy and promotes academic achievement to those students participating in these programs.

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APPENDICES

Appendix A

Two-Way Spanish Dual Immersion Program Student Survey

Survey #: _____

Two-Way Spanish-English Dual Immersion Program Student Survey

1. What has the Two-Way Spanish-English Dual Immersion Program provided you?

_____

_____

2. Did you know you were part of a specialized program? ☐Yes ☐No

If yes, how did you know? _____

_____

3. Do you have any specific emotions about being part of a specialized program? Why do you feel this emotion?

_____

_____

4. Have your grades improved since you have been part of this program?

1	2	3	4	5
Completely Disagree		Neutral		Completely Agree

5. My learning of another language has improved in the Dual Immersion Program.

1	2	3	4	5
Completely Disagree		Neutral		Completely Agree

6. Why do you think your language gas improved since you have been in the Dual Immersion Program? Explain.

_____

Appendix B

Two-Way Spanish Dual Immersion Program Parent Survey

Survey #: _____

Two-Way Spanish-English Dual Immersion Program
Parent Survey

1. Check one: My relation to the child in the Two-Way Spanish-English Dual Immersion Programs is: _____ Mother _____ Father _____ Legal Guardian

2. What are the reasons you enrolled your child into the Two-Way Spanish-English Dual Immersion Program?

3. List the members that live in your household (adults and children). Please indicate the predominant language spoken by each member.

Adult _____ Predominant Language _____
Adult _____ Predominant Language _____
Adult _____ Predominant Language _____
Child _____ Predominant Language _____
Child _____ Predominant Language _____
Child _____ Predominant Language _____

4. How do you help support your child to become bilingual?

5. How do you help support your child to become biliterate?

6. As a parent of a child that has participated in this program since kindergarten, has parent involvement increased over the past six years with the Dual Immersion Program?

1	2	3	4	5
Completely Disagree		Neutral		Completely Agree

Encuesta Para Padres

Indique los miembros que viven en su hogar (adultos y niños). Por favor Indique el idioma predominante que habla cada miembro.

Adulto _____ Idioma Predominante_____
Adulto _____ Idioma Predominante_____
Adulto _____ Idioma Predominante_____
Nino(a) _____ Idioma Predominante_____
Nino(a) _____ Idioma Predominante_____
Nino(a) _____ Idioma Predominante_____

Muy en
desacuerdo

Muy de
acuerdo

Appendix C

Two-Way Spanish Dual Immersion Program Teacher Survey

Survey #: _____

Two-Way Spanish-English Dual Immersion Program
Teacher Survey

1. How many years have you been teaching? _____

2. How many years have you been teaching in a Dual Immersion Program? _____

3. Explain how curriculum has played a part in the instruction of two languages.

4. Have you experienced any challenges specific to this program? If so, how did you overcome these challenges?

5. I have been supported by school and district personnel with the Dual Immersion Program.

1	2	3	4	5
Completely Disagree		Neutral		Completely Agree

6. What support have you received from the school and district personnel?

Appendix D

District Analyses Tables

Table D1

District ELA Analysis of Response Profiles

	Value	*SE*	*t*-value	*p*-value
β_0 (Intercept)	-1.276	0.254	-5.017	0.000***
β_1 (Grade3)	0.188	0.214	0.877	0.381
β_2 (Grade4)	-0.225	0.187	-1.203	0.230
β_3 (Grade5)	0.192	0.237	0.810	0.419
β_4 (Trad.)	0.038	0.190	0.197	0.844
β_5 (EP)	1.246	0.257	4.850	0.000***
β_6 (Female)	0.394	0.160	2.466	0.014**
β_7 (Grade3 * Trad.)	-0.078	0.168	-0.461	0.645
β_8 (Grade4 * Trad.)	0.658	0.144	4.561	0.000***
β_9 (Grade5 * Trad.)	0.059	0.186	0.319	0.750
β_{10} (Grade3 * EP)	-0.163	0.226	-0.720	0.472
β_{11} (Grade4 * EP)	-0.139	0.197	-0.707	0.480
β_{12} (Grade5 * EP)	-0.267	0.251	-1.062	0.289

Table D2

District Math Analysis of Response Profiles

	Value	*SE*	*t*-value	*p*-value
β_0 (Intercept)	-0.887	0.273	-3.250	0.001***
β_1 (Grade3)	0.054	0.190	0.283	0.777
β_2 (Grade4)	-0.179	0.231	-0.776	0.438
β_3 (Grade5)	0.031	0.214	0.147	0.883
β_4 (Trad.)	0.144	0.204	0.705	0.481
β_5 (EP)	0.930	0.275	3.376	0.001***
β_6 (Female)	0.071	0.173	0.414	0.680
β_7 (Grade3 * Trad.)	-0.235	0.151	-1.558	0.120
β_8 (Grade4 * Trad.)	0.110	0.177	0.621	0.535
β_9 (Grade5 * Trad.)	-0.206	0.168	-1.224	0.222
β_{10} (Grade3 * EP)	0.104	0.201	0.517	0.605
β_{11} (Grade4 * EP)	0.141	0.243	0.582	0.561
β_{12} (Grade5 * EP)	0.082	0.227	0.362	0.717

Table D3

SBAC ELA Analysis of Response Profiles

	Value	*SE*	*t*-value	*p*-value
β_0 (Intercept)	-1.207	0.259	-4.655	0.000***
β_1 (Grade4)	-0.336	0.144	-2.333	0.021*
β_2 (Grade5)	-0.191	0.181	-1.054	0.293
β_3 (Trad.)	0.242	0.193	1.255	0.211
β_4 (EP)	1.024	0.261	3.927	0.000***
β_5 (Female)	0.451	0.169	2.663	0.008**
β_6 (Grade4 * Trad.)	-0.029	0.113	-0.260	0.796
β_7 (Grade5 * Trad.)	-0.032	0.142	-0.222	0.824
β_8 (Grade4 * EP)	0.398	0.153	2.605	0.010**
β_9 (Grade5 * EP)	0.225	0.192	1.174	0.241

Table D4

SBAC Math Analysis of Response Profiles

	Value	*SE*	*t*-value	*p*-value
β_0 (Intercept)	-0.910	0.277	-3.281	0.001**
β_1 (Grade4)	-0.179	0.156	-1.149	0.252
β_2 (Grade5)	-0.239	0.150	-1.595	0.112
β_3 (Trad.)	0.117	0.206	0.570	0.570
β_4 (EP)	0.956	0.278	3.438	0.001***
β_5 (Female)	0.118	0.187	0.633	0.527
β_6 (Grade4 * Trad.)	0.016	0.122	0.127	0.899
β_7 (Grade5 * Trad.)	0.131	0.118	1.111	0.268
β_8 (Grade4 * EP)	0.188	0.165	1.142	0.255
β_9 (Grade5 * EP)	0.191	0.159	1.206	0.229

Table D5

LAS Links Analysis of Response Profiles

	Value	SE	t-value	p-value
β_0 (Intercept)	-0.259	0.322	-0.803	0.424
β_1 (Grade3)	-0.474	0.202	-2.350	0.020*
β_2 (Grade4)	-0.347	0.258	-1.341	0.182
β_3 (Grade5)	-0.626	0.231	-2.704	0.008**
β_4 (EO)	-0.331	0.374	-0.884	0.378
β_5 (ER)	0.305	0.418	0.731	0.467
β_6 (Female)	0.670	0.237	2.829	0.005**
β_7 (Grade3 * EO)	0.526	0.239	2.197	0.030*
β_8 (Grade4 * EO)	0.346	0.307	1.129	0.260
β_9 (Grade5 * EO)	0.734	0.275	2.674	0.008**
β_{10} (Grade3 * ER)	0.734	0.267	2.751	0.007**
β_{11} (Grade4 * ER)	0.607	0.342	1.775	0.078
β_{12} (Grade5 * ER)	0.895	0.306	2.926	0.004**