THE ACADEMIC AND LINGUISTIC EFFECTIVENESS OF A DUAL LANGUAGE PROGRAM: A COMPARISON OF STUDENT ACHIEVEMENT WITHIN ONE DISTRICT

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Valerie Fuhriman-Cleverly

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Major Professor: Russell Joki, Ed.D.

AUTHORIZATION TO SUBMIT DISSERTATION

This dissertation of Valerie Fuhriman-Cleverly, submitted for the degree of Doctor of Education with a major in Educational Leadership and titled "The Academic and Linguistic Effectiveness of a Dual Language Program: A Comparison of Student Achievement Within One District," has been reviewed in final form. Permission, as indicated by the signatures and dates given below, is now granted to submit final copies.

Major Professor _____ Date 4-17-14
Dr. Russell Joki

Committee Members _____ Date 4-17-14
Dr. Ben Earwicker

_____ Date 4/17/14
Dr. Lawanna Lancaster

Program Director _____ Date 4-17-14
Dr. Loredana Werth

Discipline's College Dean _____ Date 4/17/14
Dr. Paula Kellerer

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Most importantly, I thank my family. None of this would have been possible without them. *Mami querida, me diste tu cultura y tu idioma. Sin ti, la educación bilingüe nunca hubiera sido parte de mi vida. Aunque eso ha sido muy importante en mi carrera y en mis estudios, no compara, para nada, con el ejemplo que me has dado. De ti aprendí como vivir dignamente como una hija de Díos y como ser una buena madre de la cual mis hijos pueden tener orgullo.* I cannot thank my husband, Randy, and my children, Bentley, Kimball J, and Dayvis, enough for the sacrifices they have made to make my dreams and goals come true. While I have put in long hours of hard work, the true sacrifice has been theirs. You have earned this as much as I have and probably more. Thank you for persevering through this—twice.

DEDICATION

I dedicate this dissertation to the original Dr. Fuhriman. You have always been my hero and inspiration. For as long as I can remember, you have let me know the importance and value of education. You not only encouraged me to set high goals and work hard to meet them, but you set the example by doing it first yourself. I hope that I can continue to walk in your footsteps, and maybe, someday, I'll be just like you, Dad.

ABSTRACT

This quantitative matched-pair ($N = 53$) study examined the academic and linguistic effectiveness of a two-way dual language program in a rural Western United States elementary school. The school in this study was a magnet school. Matched pairs were defined as students who attended the dual language school from kindergarten through fifth grade and like peers from the dual language students' neighborhood schools. This study used ex post facto, state standardized testing data to compare the academic achievement of students and the English language acquisition of English language learner (ELL) students. This study used a matched-pair *t*-test to determine if a statistically significant difference existed between the achievement of students who participated in a two-way dual language program with those who did not. The study found that participants of the two-way dual language program scored equally as well as like peers in reading, math, language usage, and science. The study also found that ELL students scored equally as well as their like peers in language usage, math, and science. However, they scored below their like peers in reading. The study also analyzed ELL student acquisition of English and found that the participants of the two-way dual language program reached the same levels of English acquisition as did their like peers. Based on these findings, the researcher's suggestions for further research include a detailed study into what led to lower reading scores for the ELL participants of the two-way dual language program as compared to like peers at their neighborhood schools. What changes need to be made to the two-way dual language program at Los Campos to improve the reading skills of ELL students? Is there any difference in the levels of heritage language development between minority language speakers who participate in a two-way dual language program and those who participate in a general education program?

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The Introductory Vignette

The little dark-haired girl sat quietly at the end of the third row in Mrs. McCann's first-grade class. She listened intently, trying to make sense of what her teacher was saying to the class. She watched, brown eyes focused sharply on every movement the teacher made. Maybe, she thought, she'd be able to understand what Mrs. McCann was saying if she paid close attention to not just the teacher's words, but her movements as well.

Mrs. McCann picked up a piece of paper the color of a newspaper in one hand and a thick yellow pencil with the other. Using the pencil, she pointed to the wide lines on the paper. She tapped on the dotted line that ran between two solid lines as she continued to talk. She paused, smiled warmly at her students and then continued in her sweet British accent to explain the assignment to the class. She turned to the board and wrote an example. Turning back to her class again, she motioned for the students to begin.

Eagerly they all picked up their pencils and began to write on the thin sheet of grayish paper, all except the dark-haired girl at the end of the third row. Cautiously, she picked up the thick yellow pencil and carefully adjusted her grip, making sure she was holding the pencil just as her mother had taught her. She touched the black tip of the pencil to paper and paused. She didn't know what she was supposed to do. She looked up. As her gaze traveled around the room, tears began to gather on her lower lashes. She quickly looked down and blinked them way. She had only been in Mrs. McCann's class for one week, and the other kids were already making fun of her because she didn't speak English. She didn't want to give them another reason to tease her.

When she looked up again, Mrs. McCann was standing next to her desk with a concerned look on her face. After a short moment she smiled at the dark-haired girl, reached down, and took the pencil from her hand. She reached into the girl's desk and withdrew a yellow and green box of crayons. She opened the box, tipped it slightly forward so that the crayons were half in half out of the box. She set the box down next to the paper and took out a crayon. She handed the purple crayon to the girl and pointed to the paper. The girl took the crayon and continued to look at her teacher expectantly. Mrs. McCann frowned slightly, her shoulders drooped a little and she sighed in frustration. Then she picked up another crayon, pointed to the paper with one hand and made a motion as if she were coloring the air in front of her. She smiled, pointed to the girl and then to the paper. The girl smiled back and Mrs. McCann turned to walk to her desk.

Using the purple crayon that her teacher had given her, the dark-haired girl adjusted her grip just as she had been taught. With great determination to make her teacher proud, she began to draw. On her paper she drew a rippling purple ocean, upon which bobbed a purple sailboat, guided by a purple sailor, all under the view of purple seagulls that were flying towards the purple sun. When she was finished, she carefully wrote on the top of the paper, "Para mi maestra," and then began to sign her name, "V…a…l…"

That was nearly 40 years ago. Now, as the principal of a dual language school, I often find myself standing in the back of classrooms looking for the "little dark-haired girl." I haven't found her yet. I don't see students sitting off to the side because their teacher, however well intentioned, doesn't know what to do with them. I don't see students given alternative assignments because they don't understand enough English to be actively engaged in learning with their English-speaking peers. What I see, instead, are teachers who have prepared

themselves to meet the academic and linguistic needs of a diverse group of students. I see teachers teaching in Spanish to little brown-haired, black-haired, and yellow-haired boys and girls. I see students engaged in learning in their heritage language, while others work closely with their peers and their teachers to negotiate the meaning of a new language.

My experiences as a limited English proficient student have profoundly influenced my choices in life and ultimately whom I have become. Now, as I complete my Doctor of Education at Northwest Nazarene University, I am determined to make my dissertation not only a report of hard data that examines dual language instruction in a scientific manner, but a personal story that conveys the tremendous impact that teaching and learning in unique and meaningful ways can have upon children. This and other vignettes were inspired as the vehicle for the personal element by the doctoral study of a colleague and mentor, Dr. Heidi Curtis, who used the vignette in her dissertation, "A Mixed-Methods Study Investigating Parental Involvement and Student Success in High School Online Education" (2013).

Introduction

Current educational trends have placed increased pressure on both educators and parents alike to provide rigorous learning opportunities for all children in order to prepare them for high-stakes testing. Educators and parents alike seek to provide students with an education that will prepare them for an increasingly diverse and global community. In response to these needs, schools and parents have sought out alternative methods for meeting the academic needs of children (Adelman & Vallone, 2007; Crawford, 2007; Thomas & Collier, 2003b). One such approach is dual language instruction. Researchers (Christian, Howard, & Loeb, 2000; Collier & Thomas, 2005; Howard, Sugarman, & Christian, 2003; Lindholm-Leary, 2005) have described

dual language instruction as a type of bilingual educational program that joins together language minority and language majority students in the same classroom, beginning typically in kindergarten, to provide content area instruction and language development in both languages for all students for the purpose of meeting high-academic standards and helping students become bilingual and biliterate. Thomas and Collier (1998) along with Krashen (2001) described dual language programs as being additive in nature for English language learners (ELL)–sometimes referred to as limited English proficient (LEP) students–and enrichment in nature for heritage English speakers. An additive program does not replace a student's heritage language, but adds to the language base that the student already has. Likewise, an enrichment program enhances the knowledge the students bring with them (Collier & Thomas, 2004, 2005; Lindholm-Leary, 2003a). Thus, this type of program has benefits for both the minority and majority language students.

In the fall of 2007, a school district in the Western United States opened a dual language magnet school, Los Campos Dual Language Magnet School, with the promise that students who entered as kindergarteners would emerge as academically high-achieving, bilingual fifth graders. Following the pattern and purpose of dual language instruction, Los Campos' program was intended to provide heritage language instruction in content areas for ELL students while developing English language skills (Collier & Thomas, 2004; Cummins, 2000; Genesee, Lindholm-Leary, Saunders, & Christian, 2005). For heritage English speakers, the program provided the enrichment opportunity of learning a second language. Additionally, both groups were provided with high-quality and challenging academic instruction designed to fully prepare students for high-stakes testing and to participate in a diverse community (Charbonneau, Gomez,

Waite, & Vang, 2009; Collier & Thomas, 2004; Lindholm-Leary, 2003b; No Child Left Behind [NCLB] Act of 2001, 2002; Thomas & Collier, 2003b).

The No Child Left Behind (NCLB) Act provided guidelines meant to ensure that regardless of the program model, all ELL students meet the same academic standards as their heritage English language peers. Among the requirements put in place by NCLB were that achievement objectives and goals be identified each year for each individual ELL student, all students in third grade through fifth grade be tested, instruction be aligned to the state standards, instruction be founded on the research of best practices, and student data be collected and used to drive instruction and reform programs as needed (NCLB, 2002). Lindholm-Leary (2005) posited that both heritage English speakers and students who started school as ELL students reached higher levels of academic and cognitive function as bilinguals than do their monolingual peers. This research was supported by the extensive work of Collier and Thomas (2004, 2005, 2011), Thomas and Collier (2003a) and numerous other studies (Alanis, 2000; Cobb, Vega, & Kronauge, 2006; Collier, Thomas, & Tinajero, 2006; De Jesus, 2008; Genesee et al., 2005; Krashen, 2001; Krashen & McField, 2005; Quintanar-Sarellana, 2004; Thomas & Collier, 2003b).

Students who have participated in dual language instruction reap benefits within the classroom and beyond. The work of Christian, Howard, and Loeb (2000) showed that dual language programs meet the academic and linguistic needs of both language majority and language minority groups, allowing all participants a more equal access to instruction. Collier and Thomas (2004), along with Krashen (2001), pointed out that dual language programs allowed ELL students to bridge the learning gap much more quickly, while for ELL students not participating in a dual language program, the gap tended to get wider even after the students had

become proficient at English. Alanis and Rodriguez's (2008) research showed that minority students participating in a dual language program tended to have higher self-esteem than do their peers in a general education program. Along these lines, the work of Arce (2000) indicated that participants of dual language instruction tended to be more engaged in their own learning, and Collier and Thomas (2004) demonstrated that dual language participants tended to have less behavior-related referrals. In addition, their work showed that the benefits of participation last long after the dual language program ended, leading to dual language participants being better prepared to take advantage of college and career opportunities.

Statement of the Problem

The magnet school in this study has been implementing a dual language program for 7 years. To date, no in-depth research has been conducted to determine if the program at Los Campos was meeting the threefold purpose of dual language instruction: high-academic achievement, bilingualism, and developing positive cultural attitudes (Adelman & Vallone, 2007; Krashen, 2004). In the spring of 2011, for the first time, a cohort of students from Los Campos took the state's standards achievement test (SSAT). At a glance, it appeared that the students demonstrated high levels of achievement. However, this was not examined using statistical measures.

Research (Baig, 2011; Farruggio, 2010; Ramos, 2007; Wang, 2006) has demonstrated that parents were typically pleased with their child's participation in dual language programs. At Los Campos, undocumented comments from parents, community members, teachers, and school and district administration indicated a positive perception of the effectiveness and success of the dual language instruction at Los Campos. Within the district, there existed a confidence that the school was meeting the goals of a dual language program and that a close review of the evidence

would confirm what standardized tests scores seemed to be indicating. This study was intended to provide evidence of the effectiveness of the dual language program at Los Campos by using statistical analysis of student achievement data in comparison to like peers not participating in a dual language program.

Background to the Study

Los Campos was established as a kindergarten through fifth-grade, two-way dual language school. Entrance was through a lottery, and equal access was given to both majority language students and minority language students—half of the available spaces in kindergarten were reserved for English-speaking students and half for Spanish-speaking students. Each kindergarten cohort was made up of approximately 100 students. There was some attrition as students progressed through the grades. The first cohort began with 104 students. When that group reached fifth grade, 82 students remained in the cohort, a 78% retention rate.

The program model implemented at Los Campos was an 80:20 model. This meant that students in kindergartern and first grade received instruction in Spanish 80% of the day and English instruction 20% of the school day. Second-grade students spent 70% of the day learning in Spanish and 30% learning in English. The ratio for third grade was 60:40, and the language ratio for fourth and fifth grade was 50:50. Unlike foreign language classes, the instructional time spent in the minority language was not for the sole purpose of learning the language, but the language itself was used as a vehicle for the instruction of core content material.

Table 1

Language of Instruction Ratios Converted to Time

Grade Level	Spanish to English Ratio	Total Instructional Time in Minutes	Spanish Instructional Time in Minutes	English Instructional Time in Minutes
Kindergarten & First Grade	80:20	335	268	67
Second Grade	70:30	350	245	105
Third Grade	60:40	350	210	140
Fourth Grade & Fifth Grade	50:50	365	183	182

Table 1 illustrates how language ratios relate to instructional time. The total minutes represent the time that students spent in the classroom. This time excluded recesses and lunch time. The younger grades had more recess time, therefore they had less instructional time. The lower grade also had more instructional time in Spanish, while the upper grades had more instructional time in English.

In kindergarten and first grade, all content areas—math, science, social studies, reading, and language arts—were in Spanish. Only reading and language were also taught in English. In second grade, social studies was added to the content that was taught in English. In grades 3–5, the staff and administration strategically selected the courses that appeared in state testing to be taught in English. For example, students received all of their instruction in math from grades K–2 in Spanish. Starting in third grade, students received math instruction in English. While students had been building math skills in Spanish, by teaching math in English starting in

third grade, the intention was to continue to build math skills, while at the same time developing the vocabulary necessary for students to be successful in state testing. With this same reasoning in mind, science was taught in English in fifth grade. Additionally, the state required that the fourth-grade social studies course focus on the state's history. This course was taught in English.

Tables 2–5 show the distribution of content areas by language for each grade level. The tables include content areas that are referred to as "specials." These areas are physical education, music, library, and computers. These classes were taught by specialists and not by the regular classroom teacher. The specialists for library and computers were bilingual and provided all instruction in Spanish. The specialists for physical education did not speak Spanish and provided all instruction in English. While the specialist for music was not bilingual, she did teach songs in Spanish as well as in English. However, on the tables, music appears only in the English column. These classes were also taught on a rotation schedule, meaning that students did not receive instruction in each of these areas every day, but rather in one area each day, and each day of the week, students received instruction in a different special area.

Table 2

Language of Instruction for Grades K–2 by Content Area

Kindergarten, First Grade, & Second Grade	
English	**Spanish**
Reading	Reading
Language Arts	Language Arts
Physical Education	Math
Music	Science
	Social Studies
	Library
	Computers

From Table 2, it can be seen that instruction in the lower grades at Los Campos was conducted primarily in Spanish. Tables 3–5 show how the instruction at Los Campos transitioned from predominately Spanish to a balance of both languages. While the language ratios for kindergarten and first grade differed from that of second grade, the same content areas were taught in each language. What differed was the amount of time spent in each content area and in each language.

Table 3

Language of Instruction for Third Grade by Content Area

Third Grade	
English	**Spanish**
Reading	Reading
Language Arts	Language Arts
Math	Science
Music	Social Studies
Physical Education	Library
	Computers

The ratio of language of instruction at Los Campos for third grade was 60% Spanish and 40% English. The above comparison appears as if there was nearly a balance between the content areas taught in each language. While this may have been so, the teachers at Los Campos strictly adhered to the time ratios illustrated in Table 1. To meet the time specifications, teacher spent more or less time in the designated content areas as needed. Reading and language arts were areas of focus when more time was need to be spent in either language.

Table 4

Language of Instruction for Fourth Grade by Content Area

Fourth Grade	
English	**Spanish**
Reading	Reading
Language Arts	Language Arts
Math	Science
Social Studies	Library
Music	Computers
Physical Education	

Table 5

Language of Instruction for Fifth Grade by Content Area

Fifth Grade	
English	**Spanish**
Reading	Reading
Language Arts	Language Arts
Math	Social Studies
Science	Library
Music	Computers
Physical Education	

The language ratios for fourth grade and fifth grade were equal. However, there was a difference in the content taught at each grade level. Namely, social studies was taught in English in fourth grade because the curriculum focused on the state's history, and science was taught in English in fifth grade because state testing assessed science at that level.

The separation of languages was key to the instruction at Los Campos. Teachers only used the language of instruction during the designated time period. Teachers refrained from code-switching or consecutive translation, a practice supported by the research (Altarriba & Heredia, 2008; Baker, 2011; Bhatia & Ritchie, 2006; Cummins, 2000; Hadi-Tabassan, 2005; Rodriguez, Carrasquillo, & Kyung, 2014). Instead, teachers relied on negotiating meaning by using visual aids, gestures and motions, songs, movement, and cognates.

The first cohort of Los Campos students completed the kindergarten through fifth-grade program in the 2012–2013 school year. This group of students had taken the SSAT in third grade, fourth grade, and fifth grade. At all three levels, students scored well in both reading and math. However, no research had been conducted to determine if the program met the expectations set forth at its beginning, nor had its achievement levels been compared to that of other elementary schools in the district. Crawford (2007) contended that standardized tests have led to the decline of bilingual programs as more districts favor all-English instruction in order to prepare students for state testing. It has not yet been determined if teaching the students of Los Campos using significant amounts of Spanish has had any effect. A focus of the dual language program at Los Campos was to provide instruction to help all ELL students to attain higher levels of academic achievement, while at the same time, develop their English language skills. Neither of these areas had been researched to determine the effectiveness of the program.

At a surface glance, the dual language program at Los Campos appeared to be a success. However, no analysis had taken place to identify if any of the key factors listed above were in place and to what degree. If the program was as successful as it appeared to be, in addition to evaluating the existence of the identified factor, new factors may be identified.

Research Questions

Creswell (2008, 2014) and Marshall and Rossman (2011) emphasized the importance of the research question in narrowing the focus of the study and guiding its progression. The following research question guided this quantitative study: Is there a statistically significant difference in the achievement, both academically and linguistically, of the students at Los Campos as compared to like peers from their neighborhood schools?

The subquestions that provided necessary information to answer the research question were:

1. How do the students of Los Campos compare academically to like peers at their neighborhood schools as measured by the SSAT?
2. How do ELL students at Los Campos compare to like peers at their neighborhood schools as measured by the SSAT?
3. How do ELL students at Los Campos compare to like peers at their neighborhood schools in English acquisition as measured by the SELA?

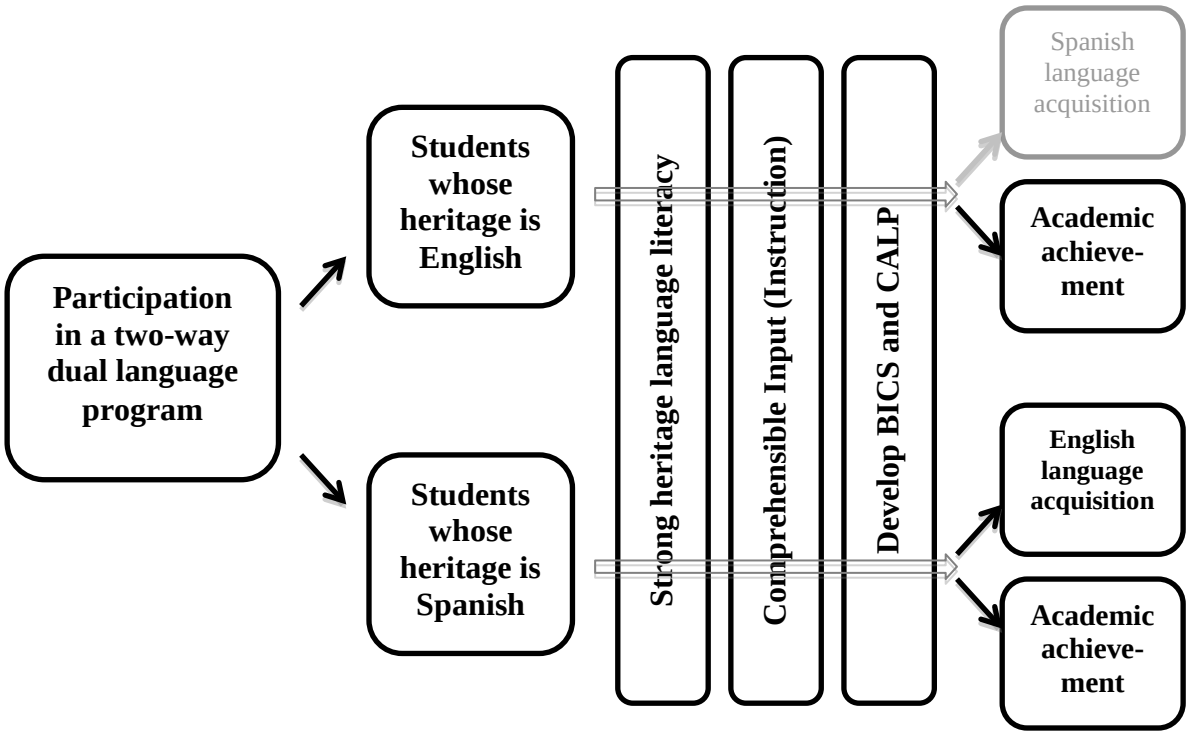
Theoretical Framework

The theoretical framework for the dual language program at Los Campos was founded around three elements. The framework assumed it was essential for students to develop strong literacy skills in their heritage language for the acquistion of a second language (Collier & Thomas 2004, 2005, 2009), and students received instruction in a language comprehensible to them (Krashen, 1992). This did not mean instruction had to be in their heritage language, but it

had to be made comprehensible through delivery. Additionally, students had to develop both a social language and an academic language. It was possible for students to develop social language, or basic interpersonal communication, without developing the academic language or cognitive academic language proficiency that was necessary to access classroom instruction (Cummins, 1981, 1992). The delivery of instruction at Los Campos focused on providing students with the development of and access to these elements with the intent that it led to high-academic achievement and second-language acquisition.

Figure 1

Theoretical Framework for Dual Language Instruction at Los Campos Dual Language Magnet School



Note: BICS repesents basic interpersonal communication skills. CALP represents cognitive academic language proficiency.

Figure 1 illustrates the theortical framework for dual language instruction at Los Campos. Through participation in dual language instruction, both majority language students and minority language students received instruction that built strong heritage language literacy, students received instruction that was compehensible regardless of the language of delivery, and students developed both basic interpersonal communication skills and cognitive academic language proficiency (Cummins, 1981). Basic interpersonal communication skills refer to the language and vocabulary that is used for day-to-day conversation. In a school setting, it may be referred to as playground language. Cognitive academic language proficiency refers to the language and vocabulary that are necessary to have full access to academics. As an outcome, students attain high-academic achievement and second-language acquisition. Spanish language acquisition is illustrated in Figure 1, but was not part of this study, as no premeasures and postmeasures were put into place when students entered as kindergarten students and when they exited as fifth-grade students.

Description of Terms

Education has its own jargon or terminology specific to particular disciplines. Even within education, terms may have different meanings for different individuals or in different situations. To ensure a common understanding, researchers provide an operational definition specific to their study (Creswell, 2008). Creswell defined an operational definition as "the specification of how you will define and measure the variable in your study" (p. 160). The following terms were used throughout this study.

Academic achievement. Meeting the state academic standards at a proficient or higher level.

Additive bilingualism. Adding of a second language rather than replacing the first language with a more desirable language.

Bilingual education. An instructional model in which two languages are used as the vehicle for instruction.

Bilingualism. Communicating both orally and in written form in two languages.

Biliteracy. Effective communication in two languages using printed language.

Code-switching. Using two languages intermixed to communicate a message. Both languages are used grammatically and linguistically correctly. This is not blending of words from two languages to create new words.

Common Core. An education initiative in the United States that details what K–12 students should know in English language arts and mathematics at the end of each grade.

Consecutive translation. A school setting in which the teacher provides instruction in one language and then immediately translates the instruction into another language.

Content area. Academic subjects of instruction. Math, reading, writing, science, and social studies are typically referred to as content areas.

Dual language. This instructional model is also referred to as "two-way immersion" or a "two-way, bilingual program." It references the use of two languages as the vehicles for the delivery of content area instruction.

Early exit program. A bilingual program with aims at transitioning a student quickly from their heritage language to the target language.

English as a second language. A method for teaching ELLs that uses only the target language.

English language development. Instructional time specifically dedicated to the development of the English language skills of ELL students.

English language learner (ELL). An individual who is learning the English language as a second language.

General education. The regular school program that the average student receives.

Heritage language. Also referred to as the native language. It is the first language spoken by an individual.

High-stakes testing. Assessments typically used by the state to make significant educational determinations, such as promotions.

Hispanic. An individual of Spanish culture or origin.

Immersion program. A bilingual education program intended for language majority students in which all instruction is provided in the target language.

Language acquisition. The process of learning and internalizing a language.

Language dominance. The language in which an individual has developed higher levels of fluency.

Language minority. An individual whose dominant language is other than English.

Language proficiency. Developed levels of language in speaking, listening, reading, and writing that enable an individual to communicate effectively.

Late exit program. A bilingual program model that lasts for an extended time. Typically, this program focuses on maintaining and developing both languages.

Latino. An individual of Latin American ancestry or descent.

Learning gap. The difference between what a student has learned and what the student was expected to learn.

Like peer. An individual who is similar to another in gender, age, ethnicity, language proficiency, and socioeconomic status.

Limited English proficient (LEP). Limited levels of abilities in reading, writing, listening, and speaking English.

Linguistic achievement. Meeting the state standards for language acquisition.

Magnet school. A school that provides a specialized instructional approach or curriculum, which is open to all individuals who live within the school district boundaries.

Maintenance program. A bilingual program model that seeks to maintain the student's heritage language.

Majority language. The language of the majority of individuals. The language of the community.

Minority language. The language that is spoken by a portion of individuals within a community.

Native language. The first language acquired by an individual.

Neighborhood school. The school a student should attend as designated by boundaries set by the district. A student lives within this school's boundaries.

One-way dual language program. A bilingual program model intended for minority language students in which they are the only students expected to develop two languages.

Pullout program. An instructional program that requires that the student be taken out of the regular classroom for delivery of instruction.

Second language. A language learned in addition to an individual's native language.

Standardized test. A test that requires all individuals taking the test to answer the same questions, using the same format, and is scored in a standard or consistent manner.

State English language assessment (SELA). A state assessment used to determine an individual's level of English acquisition.

State reading indicator. A state assessment used to determine an individuals level of reading fluency. The number of words an individual can read within one minute.

State standards achievement test (SSAT). A state assessment used to determine a student's level of achievement on state standards.

Submersion program. A bilingual program model for ELL students that provides them with no second-language learning support and that is conducted solely in the target language.

Transfer. An individual's ability to use skills learned in the first language in the second language as well.

Transitional bilingual program. A bilingual program model intended to move ELL students from their heritage language to English quickly.

Two-way dual language program. A bilingual program model in which both language minority and language majority students are taught in two languages.

Significance of the Study

Many large-scale research studies have been conducted on the effectiveness of dual language programs (Collier & Thomas, 2004; De Jesus, 2008; Genesee et al., 2005; Krashen, 2004; Lindholm-Leary, 2005; Thomas & Collier, 1998, 2003a, 2003b). Many small-scale studies have also been conducted on program effectiveness (Adelman & Vallone, 2007; Alanis, 2000; Collier et al., 2006; Quintanar-Sarellana, 2004). In addition, studies have been conducted on cognitive development of bilingual students, students' perception of dual language programs, parental concerns and involvement, equity in language acquisition, and program access (Barac & Bialystock, 2012; Baig, 2011; Black, 2006; Dworin, 2011; Farruggio, 2010; Franquiz, Salazar, &

DeNicolo, 2011; Ramos, 2007; Wang, 2006). However, most of these studies were conducted in large, urban school districts or schools (Collier & Thomas, 2004; De Jesus, 2008; Genesee et al., 2005; Krashen, 2004; Lindhom-Leary, 2005; Thomas & Collier, 2003a, 2003b), and were located in communities where a language other than English was predominantly spoken in addition to English or in locations that border a country where English was not the native language (Alanis, 2000; Collier & Thomas, 2004; De Jesus, 2008; Quintanar-Sarellena, 2004). This study differed in that it was conducted in a smaller, rural, semiurban school and community where English was the majority language and situated far from any nonnative English-speaking communities.

Of additional significance was the availability of one-to-one, matched-pair comparisons afforded by a magnet school. This meant that the students who attended Los Campos lived within the boundaries of a neighborhood school, but chose to attend Los Campos instead. Krashen (2004) lamented that "several studies provide data using standardized tests without comparison groups" (p. 2). This study reviewed the data provided by standardized tests in comparison to a group of like peers.

Another unique feature of this study was that the dual language program at Los Campos was not commonly used. The significance of the project was enhanced because the language model used at Los Campos was 80:20—meaning that 80% of instructional time was in the nondominant language and 20% was in English. Typical language ratios of a dual language program are either 50:50 or 90:10 (De Jesus, 2008; Krashen, 2004). It stands to reason then, that the majority of research conducted on dual language programs has studied 50:50 models or 90:10 models.

Furthermore, the significance of this study was substantial to the district in that the school district made a commitment to a program that may be viewed as an alternative to traditional instructional programs and elementary schools. The district had committed itself to the extent that it constructed a new school to house Los Campos and employed a full staff that, at time of the study, consisted of multiple teachers in kindergarten through fifth grade. Furthermore, the parents of Los Campos students voiced their wishes that the district extend the program beyond fifth grade. This study revealed concrete evidence of the success of Los Campos in meeting the goal that students who entered as kindergarteners emerged as academically high-achieving, bilingual fifth graders and made a strong case that dual language should be continued and extended in the district. Additionally, it helped in the recruitment of minority language students, which was traditionally a challenge for the school.

Limitations and Delimitations

Marshall and Rossman (2011) described limitations as "what the study is and is not—its boundaries and how its result can and cannot contribute to understanding" (p. 76). Limitations are the influences or outside forces that cannot be controlled by the researcher. These authors described delimitations as limitations purposefully used by the researcher to establish boundaries for the study.

In this study, limitations included the location of the school where the research was conducted, the sample size, the number of matched pairs allowed by the sample size, accessibility to data, and the inability to test for language acquisition in a pre–post fashion in that no assessment of the ability of native English-speaking students to speak Spanish was conducted at the onset of the program; therefore, no comparison was made after participation in the program.

Delimitations for this included placing the focus solely on the dual language program at Los Campos, concentrating only on academic achievement and language acquisition and not on developing positive cultural attitudes, the manner in which matched pairs were made, and utilizing state standardized assessments.

Overview of Research Methods

This study was a quantitative research study using a matched-pair comparison of students from Los Campos and like peers from their neighborhood schools. Mis (2013) described quantitative methods as those that use numbers to quantify what is being observed. This study used ex post facto test scores to quantify the effectiveness of the dual language program at Los Campos. In dicussing the appropriate application of quantitative methods, Creswell (2014) explained that quantitative methods are often used to measure the influence of a treatment. For the purpose of this study, the students of Los Campos have particpated for six years in a treatment—dual language instruction. By comparing Los Campos students to similar students at their neighborhood schools, the researcher hoped to determine if the dual language program at Los Campos was effective as determined by the academic and achievement of students and the linguistic acquistion of ELL students. If the results of the study showed that there existed a positive statistical difference or no statistical difference between the academic achievement of Los Campos students, as compared to their like peers, then a conclusion could be made that the dual language program at Los Campos was effective.

Conclusion

This study analyzed the effectiveness of two-way dual language instruction at a dual language school located in a northwestern state in an urban, semirural community. The students in the school had participated in standardized state testing on a regular basis, but no evaluation of

the dual language instruction was conducted. This study sought to use ex post facto test data to analyze the academic and linguistic achievement of students. The design of the study added to its significance. This study was a matched-pair comparison between students who participated in the two-way dual language instruction and like peers at neighborhood schools. Of additional significance were the implications for the district that the outcomes presented. As with any study, this study had limitations and delimitations, which included, but were not limited to, the location of the study and the number of participants. Delimitation included the focus on just one school and the analysis of only academic and linguistic data.

Subsequent chapters will provide a review of the literature, a comprehensive outline of the design and methodology of the study, a discussion of the results, and lastly a discussion of the implications of the study.

Chapter II

The Literature Review

The Historical Vignette

Jacob Fuhrimann peddled his cart down one of the rock-riddled dirt roads of Providence, Utah. He had just left the Yoder's farm and was headed a mile and a half down the road to the Kielholz farm. He removed a neckerchief from his back pocket and wiped his brow, almost knocking his hat off in the process. He reached up and quickly adjusted it, unwilling to lose his only source of shade in the unseasonably warm weather. The Kielholzes weren't expecting him. He hadn't made prior arrangements to return so soon after his last visit. He had been lucky at five of the last six farms he had visited. He hoped his luck would hold true and that this visit would not be in vain. The harvest was fast approaching, and he knew that his own crops would keep him from returning to the farms of his clients anytime soon, so he pressed on, coming up off of the seat of his cart as he peddled harder up the slight incline. The grinding stone on the front of his cart made the effort more taxing. He told himself to be cautious and reserve his energy.

Being a Messerschleifer—a knife grinder—was hard work, but not as hard as tending to his crops and his family of seven children. Jacob worked long hours to support his family. He wanted to provide as best he could for them, but more importantly, he wanted them to grow up knowing the value of hard work. That very morning he had called them together, "Kommen Sie, Kinder!" he said in a strong German command. Jacob and his family spoke only German. "Blick auf den Zustand des Gartens. Sie haben nicht das Jäten. Kein Spiel bis es fertig ist und ich davon." There would be no time for play, he told them, until their chores were done to his satisfaction. Recalling the image of his young ones scattering to the tool shed and barn brought a smile to his face. He knew that when he returned, the work would be done; it may not be

perfect, but it would be done. He would help them work to perfection as they grew older. His pleased smile became broader, and he pressed on to his destination.

The industriousness of my Swiss-German great great grandfather was not viewed as such by the great American founding father Benjamin Franklin, who described the German immigrants as:

> *Those who come hither are generally the most ignorant Stupid Sort of their own Nation…and as few of the English understand the German Language, and so cannot address them either from the Press or the Pulpit…Why should the Palatine Boors be suffered to swarm into our Settlements and by herding together establish their Language and Manners to the Exclusion of ours? Why should Pennsylvania, founded by the English become a Colony of Aliens, who will shortly be so numerous as to Germanize us instead of our Anglifying them, and will never adopt our Language or Customs, any more than they can acquire our Complexion. (B. Franklin, 1755)*

As the principal of a dual language school, I keep my familial language anecdotes close to mind as I watch the economic and educational issues facing the families of my students. I take pride in knowing that I come from a diverse linguistic background and greatly appreciate my upbringing, which, regardless of my complexion and my surnames, has given me close ties to the culture and language of my mother, which are the language and culture of a great many of my students.

On a daily basis, I am delighted at the future prospects of the students at my school regardless of their ethnic, cultural, or economic background. Provided an education based on sound research and best practice, students at my school have the opportunity to be contributing members of society in ways that they cannot yet imagine. It is difficult to keep the smile off my

face when I see students interacting and learning in a culture and language that are not their own. I am thrilled at how willingly children accept the challenge of becoming bilingual and bicultural and the pride that they take in their accomplishments. I am amazed at how quickly children can see past the color of one's skin or the language one speaks. They do not know about the history of the type of education they are receiving; they have no clue how many studies have been conducted or how many articles have been written. All they know and all their families know and care about is that they are learning and growing and loving it.

Introduction

The body of research on bilingual education has a long history. In fact, the history of bilingualism in the United States goes back as far as written history itself. Well before immigrants began arriving on the shores of the "New World," there were many indigenous groups in America, each with its own language. As immigrants from Europe began arriving, each of those groups brought their own language and culture into the Great Melting Pot (Baker, 2011; Crawford, 1999). As each immigrant group began to establish itself, they began to institute schools that were taught in their home language.

Then, just as now, bilingual education became a political issue. One of our founding fathers, Benjamin Franklin, was one of the first to take a stand against conducting schools in a language other than English (Baker, 2011; Crawford, 1999). As early as 1855, California sought to mandate English-only instruction (Crawford, 2004; Baker, 2011; Ovando & Comb, 2012). In the 1960s, during the Civil Rights Movement, bilingual education started to become popular, but just as quickly, doubt began to rise about the federal government spending taxpayer money to promote schooling, teaching in languages other than English (Crawford, 1999; Ovando & Combs, 2012). Nonetheless, in 1968 President Lyndon B. Johnson signed into law The Bilingual

Education Act Title VII of the Elementary and Secondary Education Act (Crawford, 1999). The progress report on the effectiveness of federally funded bilingual programs came out in 1977 to 1978.

This initial report included 38 Spanish–English bilingual programs and 7000 students from 158 schools. The report stated that federally funded bilingual programs had made no significant effect on the education of ELLs (Crawford, 1999; Baker, 2011).

The discussion of the merits of teaching school in a language other than English continues today. Though it has become more complex and wide ranging. It encompasses everything from public policy and questions of social justice to program effectiveness, parental perceptions, and beyond.

Program Models and Theories

The term bilingual education is an umbrella term for a great many types of approaches to educating children. Bilingual programs cover a spectrum starting at one end with programs that provide no support in the heritage language to programs that provide a majority of instruction in the heritage language.

Transitional programs. At one end of the spectrum are "transitional programs." These programs are intended to help minority language students move quickly from the minority language to English (Baker, 2011; Ovando & Combs, 2012). Oftentimes, these programs are called "early exit programs" because they typically last for less than three years (Crawford, 1999). These programs tend to look at the heritage language of students as a deficit rather than an asset. Students' heritage languages are treated as a roadblock to academic success. One such program is submersion.

Submersion programs, sometimes known as "sink or swim," are those programs where

non-English-speaking students are placed into a general education classroom with no additional support (Baker, 2011; Cummins & Corson, 1997). Proponents of this type of program believe that by placing a student in a situation where they must learn the language in order to fully participate, the student will make more of an effort to learn in English. Another example of a transitional program is "structured immersion" or "sheltered English."

Baker (2011) explained that this type program model was intended for language minority students only and truly more of a structured submersion. This program is similar to submersion with the exception that teachers employ specific strategies to support the students as they transition to English. However, all instruction is conducted in the majority language. One of the most common forms of transitional bilingual education is teaching English as a second language. Once again, this program model uses only the majority language. In this type of model, students are pulled out of the general classroom setting to receive direct instruction on English vocabulary, grammar, and communication skills (Baker, 2011; Crawford, 1999; Cummins & Corson, 1997).

Maintenance and additive programs. At the other end of the bilingual spectrum are "maintenance and additive programs." These programs are called maintenance programs because they strive to maintain the student's heritage language and additive because they add to the language skills that the students bring with them to school. In these programs, the heritage language is seen as an asset and is used as a tool to learn the majority language and to learn content (Baker, 2011; Ovando & Combs, 2012).

Late exit programs. Maintenance and additive programs are often called "late exit programs" and tend to last at least through a student's elementary school years (Crawford, 1999). Included in these types of programs are immersion programs in which majority language

students are immersed in the minority language, receiving all of their instruction in a new language (Cummins, 2000).

Two-way dual language programs. Two-way dual language programs are also an example of additive and late exit programs. In a two-way dual language program, there are an equal number of language minority students and language majority students. Each group receives some of the instruction in a language that is new to them and some instruction in their heritage language (Baker, 2011). A unique feature of a two-way dual language program is that the minority language is used as a vehicle for teaching and learning content for both minority and majority students.

There are several different structures for two-way dual language programs. The most commonly reported are the 50:50 model and the 90:10 model (Estrada, Gómez, & Ruiz-Escalante, 2009; Gómez, Freeman, & Freeman, 2005; Honigsfeld, 2009; Krashen & McField, 2005; Lindholm-Leary, 2003b; Murphy, 2010). These refer to the ratio of time spent in the second language and time spent in English.

In a 50:50 model, students spend an equal amount of time in the minority language as they do in the majority language. While students in the younger grades spend the majority of their day learning in Spanish, research reported that students were able to transfer and apply what they learned in one language to another (Christian et al., 2000; Thomas & Collier, 2003b).

In a 90:10 model, students begin in kindergarten learning in the minority language for 90% of the school day and learning in English for 10% of the school day. The ratios decrease in the minority language and increase in the majority language with each subsequent year (Baker, 2011; Lindholm-Leary, 2003b). Research found that students who participated in 50:50 programs tended to have quick gains, but students who participated in 90:10 programs had

greater gains over time (Charbonneau et al., 2009; De Jong, 2002; Lindholm-Leary, 2005; Martin-Beltran, 2009; Mora, Wink, & Wink, 2001). An added benefit of two-way dual language instruction is that the second language is more readily acquired when it is the vehicle for instruction instead of the subject of the instruction (Christian et al., 2000; Krashen, 2004).

The silent period. Key to the implementation of a program model are the strategies, best practices, and theories put into practice. A commonly recognized theory in bilingual education is the silent period (Baker, 2011; Krashen, 1992; Howard, Sugarman, Christian, Lindholm-Leary, & Rogers, 2007). This theory claimed that second-language learners go into silent period in which they take in the new language, but are not yet ready to produce the new language. Another related theory to a student's comfort level in producing a new language is the affective filter (Crawford, 1999; Krashen, 1992; Ovando & Combs 2012). This theory was based on the concept that the language learner must have low levels of anxiety in order to be receptive and to be able to produce the language. Thus, the language learner must be comfortable and willing to take a risk in producing the new language (Krashen, 1992).

Language Competencies. Cummins (1981) presented the theory of different language competencies. His theory was based on the idea that language learners develop both basic interpersonal communication skills and cognitive academic language proficiency. These two language competencies are often described as playground language and classroom language respectively (Baker, 2011; Ovando & Combs, 2012). Uccelli, Barr, Dobbs, Phillip-Galloway, Meneses, and Sanchez (2014) expanded upon this concept by adding a third competency, cognitive academic language skills. This theory posited that a second-language learner must not only learn the vocabulary of academic content, but must also learn language forms and functions commonly used in the classroom.

Transferability. Transferability refers to learning and mastering a concept in one language and then being able to express that knowledge in the second language once the language skills have developed (Crawford, 1999; Collier & Thomas, 2009; Cummins, 1981, 2000; Ovando & Combs, 2012; Rodriguez et al., 2014). This language theory is often referred to as the Interdependence Hypothesis (Cummins, 1981, 2000). Collier and Thomas further discussed the interdependence of heritage language development and second language acquisition (2009). They presented findings that indicated that development of the heritage language was closely correlated to cognitive development. Collier and Thomas (2009) stated that children who stopped developing their heritage language before reaching the stage of formal operations where they are developmentally capable of hypothetical and deductive reasoning often experience lower academic achievement. Failure to develop adequate skills in the heritage language had the potential of leading to cognitive difficulties is both the heritage language and the second language (Baker, 2011; Collier & Thomas, 2009; Cummins, 1981, 2000, Ovando & Combs, 2012).

Factors for Success

A close look at effective dual language programs revealed that specific elements must be incorporated into the program to increase the likelihood of success. An effective dual language program provides instruction for at least six years (Krashen, 1992, 2001). Characteristically, elementary programs begin in kindergarten and extended through fifth grade. Students who participate in programs that extend beyond the elementary level are more likely to continue developing higher levels of communication in the second language and are more likely to retain the second language beyond their K–12 educational experience (Alanis, 2000; Cobb et al., 2006;

Lindholm-Leary, 2005; Murphy, 2010; Quintanar-Sarellana, 2004; Thomas & Collier, 2003b; Wu, 2005).

Additionally, students who participate in programs that extend beyond elementary school have a greater potential of becoming balanced bilinguals or individuals who can use both languages equally well (Alanis, 2000; Cobb et al., 2006; Lindholm-Leary, 2005; Murphy, 2010; Quintanar-Sarellana, 2004; Thomas & Collier, 2003a).

Programs that promote high levels of bilingualism create an additive environment in which a new language is added without taking away from the students' existing language (Thomas & Collier, 1998). The culture of the school is one where neither the monolingual English students nor the ELL students speak the language of power. In other words, both languages are given the same amount of prestige. To that end, schools foster an environment of interdependence among staff and between students and teachers. In addition, the program promotes an active participation between monolingual English-speaking parents, Spanish-speaking parents, and the school (Thomas & Collier, 1998).

Effective dual language programs identify and focus on the essential content rather than watering down the curriculum to meet the perceived linguistic capabilities of ELL students, or to meet the time limitations of the school day (Alanis & Rodriguez, 2008, Lindholm-Leary, 2005). The essential content includes providing high-quality instruction in reading, writing, and speaking in both languages. Ensuring that students became literate in both languages is critical to a successful program. Additionally, instruction reflects a separation of the two languages, and at a minimum, 50% of all instruction is delivered in the non-English language.

Effective programs neither translate content from one language to another during instruction, nor do they repeat lessons, providing them first in one language and then the other

(Lindholm-Leary, 2005; Murphy, 2010; Quintanar-Sarellana, 2004; Thomas & Collier, 2003b; Wu, 2005). Teachers and staff also provide first-rate models of both languages. Instructional staff are qualified and capable of delivering high-quality instruction in both languages (Lindholm-Leary, 2005; Murphy, 2010; Quintanar-Sarellana, 2004; Thomas & Collier, 2003b; Wu, 2005). The teachers and staff seek out opportunities to use the minority language beyond the classroom walls, such as in the hallways or on the playground (Cummins, 2000; Garcia, 2009; Lindholm-Leary, 2003a).

How closely educators adhere to the factors listed earlier can keenly influence the success of a program. The extent to which teachers implement the key characteristics of an effective program make a significant difference in students' achievement. Collier and Thomas (2004) explained that the critical components of a dual language program are not a list from which one can pick and choose. Rather, it should be considered as a *must do*, to the best of one's ability in order to increase the likelihood of students' success.

Effectiveness of Dual Language Programs

The first studies that examined the effectiveness of bilingual programs, reported that these programs were ineffective (Baker, 2011; Cummins, 1992; Ovando & Combs, 2012). Since then many studies have been conducted exploring these programs in depth and over long periods of time. Collier and Thomas (2004, 2005, 2009) and Thomas and Collier (1998, 2003a) conducted several studies; in particular, longitudinal studies that clearly showed that bilingual programs and in, specifically, dual language programs, were effective. Their work reported that students participating in these programs attained high-academic achievement while learning a second language. Their research also found that the academic success students experienced was not short-lived but continued long after their participation in a dual language program.

One reason that dual language programs may be perceived as being ineffective was that students participating in 90:10 models of dual language instruction typically lagged behind their peers in monolingual programs up through the third grade (Thomas & Collier, 2003b; Krashen, 2004). However, participants in dual language instruction met and most likely exceeded the academic achievement of their monolingual peers by fifth grade (Howard, Christian, & Genesee, 2004; Krashen, 2004; Thomas & Collier, 2003b). A meta-analysis cited Lindholm-Leary (2005) found both ELL students and heritage English speakers participating in immersion programs demonstrated larger gains over time in both math and reading than their peers participating in monolingual instruction. Students in dual language programs attained or exceeded the grade-level benchmark by middle school. By fifth grade, both ELL and heritage English speakers demonstrated academic achievement at the same level or at higher levels than their same language peers in monolingual programs (Gottlieb & Nguyen, 2005; Lindholm-Leary, 2005; Lindholm-Leary & Hernandez, 2011).

These findings were further supported by the work done by Cobb, Vega, and Kronauge (2006). Their research focused on participants of elementary, dual language programs and their success at the middle school or junior high level. Their research demonstrated that native speakers of English showed substantial positive effects in both reading and writing. ELL students in their study outperformed ELL students who did not participate in dual language programs (Cobb et al., 2006). Additionally, ELL students who participated in dual language instruction outperformed those who received English as a second language instruction. Not only did the ELL dual language students outperform their peers academically, they outperformed them in their acquisition of English (Cobb et al., 2006).

The study conducted by Alanis (2000) yielded similar results. Reading achievement for both minority language and majority language students showed consistent growth, which was higher than that of students not participating in the dual language program. Likewise, in math, participants showed continued growth that was consistently higher than their peers. Christian et al. (2000) revealed consistent data with the results stated above. Their research indicated that even though native English speakers spent a large portion of their instructional time speaking and learning in a second language, they still tended to outperform the ELL students in their dual language program who were learning in their native language on the SSATs (Christian et al., 2000). These same ELL students, however, outperformed ELL students not participating in content instruction in their native language on state standardized tests administered in English (Christian et al., 2000).

De Jesus (2008) examined the effectiveness of a dual language school in Puerto Rico. Her findings showed that 47% of students participating in a monolingual instructional program achieved proficiency in language arts on the state examination test, while 80% of dual language students attained proficiency (De Jesus, 2008). In this same study, the achievement gap between ELL students and their English dominant peers was completely done away with. The high-achievement levels of dual language participants on the state examination test led to the greatest gains ever achieved by this school in annual progress (De Jesus, 2008).

Effectiveness of Dual Language Programs for ELLs

Research by Conger (2010) made the case that bilingual programs, such as dual language programs, either interfered with English language acquisition or they had no effect whatsoever. However, his findings were refuted by the aforementioned research of Thomas and Collier

(2003a) along with the work of De Jesus (2008), Lindholm-Leary (2005), Murphy (2010), Quintanar-Sarellana (2004), and Wu (2005).

Results of several studies reported that ELL students participating in dual language programs tended to outperform their peers in reading (Collier & Thomas, 2004, 2009; Lindholm-Leary & Hernandez, 2011). In the study conducted by Lindholm-Leary and Hernandez, ELLs were divided into two separate groups: students who began as ELLs and had become fluent English speakers and students who remained identified as ELLs. Both groups outperformed other like peers, but the students who had become fluent English speakers while participating in a dual language program attained higher levels of academic achievement than both ELL students in a dual language program and ELL students in a general education program. These results illustrate that dual language instruction not only enabled students to experience high levels of academic success, but allowed students to learn English while they were receiving instruction in a minority language.

In their 2009 study, “The Astounding Effects of Dual Language Education for All," Collier and Thomas discussed in detail how dual language education bridges the learning gap for ELL students. Collier and Thomas explained the significance of bridging the learning gap for ELL students in a school climate that relied so heavily on high-stakes testing. Their research found that ELL students participating in dual language instruction outperform ELL students who participated in developmental bilingual programs and transitional bilingual programs in reading. Their research went on to show that students who participated in dual language instruction, but were no longer identified as ELLs, continued to out-perform students who also were no longer identified as ELLs, but were in general education programs. These findings were supported by

the work of Thomas and Collier (2003a), Rolstad, Mahoney, and Glass (2005), Goldenberg (2008), and Garcia and Jensen (2007).

Often the opponents of dual language instruction raised questions of equity (Pimentel, Soto, Pimentel, & Urrieta, 2008; Valdes, 1997). Conversely, a study conducted by Sugarman (2012) concluded that dual language programs created an environment of equitable instruction for all students. In particular, Sugarman (2012) pointed out that dual language programs created equity while other programs attempted to build equity. These findings were supported by an ethnographic study conducted by Soto (2002), in which non-native English students participating in a dual language program felt that they were equal to their peers. The same sentiments were not expressed at the same levels by similar children not participating in dual language programs. In their manual on dual language education, Howard, Sugarman, Christian, Lindholm-Leary, and Rogers (2007), expressed the need to provide equity within a dual language program for both language minority and language majority students. The authors explained that it is essential to create an environment that facilitates learning for all. They posited that the very nature of dual language education creates an environment where all students are provided an opportunity to acquire a second language and to access academic knowledge and not at the expense of their heritage language.

In addition to the studies listed above, research supported the benefits of dual language instruction for ELL students (Garcia & Jensen, 2007; Genesee et al., 2005; Honigsfeld, 2009). The longer ELL students stayed in a bilingual program, the more positive the outcomes were not only in English language development, but in reading and math as well (Garcia & Jensen, 2007; Genesee et al., 2005; Honigsfeld, 2009). ELL students who received long-term instruction in their native language, outperformed their ELL peers who received short-term instruction in their

native language (Garcia & Jensen, 2007; Genesee et al., 2005; Honigsfeld, 2009). The Thomas and Collier (2003b) research conducted in Texas concluded that ELL students who received five or more years of content instruction in their native language reached the 51 percentile on the Stanford 9 nationally normed test. An additional benefit for ELL students was that dual language programs provided them with the opportunity to be integrated within the classroom setting, which increased students' participation in the classroom and led to greater academic growth. In their study, Dixon, Zhao, Shin, Wu, Su, Burgess-Brigham, and Gezer (2012) showed higher passing rates on high-stakes testing, as well as higher graduation rates for ELL students who participated in dual language programs.

ELL students' English language development was dependent upon students receiving direct English language instruction (Saunders, Foorman, & Carlson, 2006). Their work found students in early grades should receive 30–45 minutes of English language development. Martin-Beltran (2009) explained that this created an opportunity for students to negotiate meaning and coconstruct understanding, which led to a richer language experience.

Parental Views on Heritage Language Instruction

Parental involvement is a key factor in effective dual language programs. Farruggio (2010) examined the views of Hispanic parents on native language instruction. His research was conducted using both qualitative and quantitative research methods. However, interviews were the primary sources of data collection. The research included perspectives of parents whose children were enrolled in an urban California school district (Farruggio, 2010). Half of the participants' children were enrolled in bilingual programs and half were not. The study showed that parents' perspectives were highly dependent upon whether or not their students were enrolled in bilingual education. The parents of bilingual educational participants viewed

bilingual education as a key to heritage language preservation and held favorable views in general of bilingual educational programs (Farruggio, 2010). Parents of students who did not participate in bilingual education had the opposing view. The parents who had attempted to enroll their children in bilingual programs, but were turned away, had decidedly negative views of bilingual education (Farruggio, 2010). Research conducted by Black (2006) and Howard et al. (2007) supported Farruggio's findings. Black (2006) found that validation and development of language and culture were key to benefiting from a dual language program and were key to parents choosing such programs for their children. Howard et al. (2007) found that positive parental and community involvement were essential to a successful program and to high student achievement.

Yan (2003) and Worthy and Rodriguez-Galindo (2006) showed similar results. Both studies used a qualitative approach to study the view of parents of culturally and linguistically diverse students on maintaining and developing heritage languages. To conduct the study, the researchers administered a survey and interviewed participants. The results of the studies indicated that the heritage language was used by the majority of students' parents in their homes, students had a positive attitude toward the heritage language and toward learning it, and parents felt that a quality education would include a bilingual setting. The studies also showed that parents believed that maintaining and developing the heritage language strengthened family ties, strengthened moral values, kept a connection with culture and community, and provided students with better opportunities through bilingualism.

Ramos (2007) related more directly to dual language programs. The researcher set out to determine parents' level of satisfaction with dual language bilingual programs and to determine the reasons for which parents supported them. The author conducted the study by having parents

of students in grades K–5 from an urban Florida school district complete a survey—366 parents participated. Ramos (2007) determined that the surveys indicated a high level of support for dual language programs among participants. Through analysis of the surveys, the author identified key factors for parents' support. Among them were heritage language preservation and inclusion of the community. The work of Worthy and Rodriguez-Galindo (2006) fell closely in line with that of Ramos' work. Their work clearly identified parents' concerns with their children losing the heritage language. Many expressed their appreciation of dual language programs that supported and encouraged the continued development of the heritage language both within the school and the community.

Benefits of Being Bilingual

The most obvious benefit of participating in a two-way dual language program was the potential for becoming bilingual and biliterate. Thomas and Collier (2003b) suggested that for most individuals, becoming bilingual was a 5-7-year process. Through her study, Lindholm-Leary (2005) showed that students who participated in two-way dual language instruction beginning in kindergarten or first grade became proficient in both languages by the time they reached fifth or sixth grade. That same study also indicated that students who participated in 90:10 programs tended to be more fully bilingual than students who participated in 50:50 programs. This study also showed that ELL students who participated in a 90:10 program and those who participated in a 50:50 program performed equally as well in English language acquisition. These results were supported by the work of Thomas and Collier (2003a) and Dixon et al. (2012).

Dixon et al. (2012) also found that higher levels of language proficiency were attained by both language majority and language minority students when the participants were afforded the

opportunity to use the second language in informal settings. Even though students participating in two-way dual language programs become bilingual, Lindholm-Leary (2005) indicated that heritage Spanish speakers demonstrated higher levels of proficiency in Spanish than did heritage English speakers. Keeping in line with Lindholm-Leary, Palmer (2009) found that participation in a two-way dual language program neither adversely affected heritage English speakers' proficiency in English nor their preference for using English.

In addition to becoming bilingual, studies by De Jesus (2008) and Barac and Bialystok (2012) found that bilingual children developed higher levels of linguistic awareness. De Jesus (2008) explained that to understand a second language, learners must constantly be mentally engaged and focused or they would not be able to fully understand what was transpiring in the new language. This continually put the learner in a state of negotiating an understanding of what was being said, while discovering how the new language worked. This continued focus on multiple aspects of language, developed students' metalinguistic abilities as well as their greater cognitive abilities (De Jesus, 2008). In their study, Barac and Bialystok (2012) administered three language assessments to three groups of bilingual children and a group of monolingual children. Students were given a vocabulary assessment, sentence formulation assessment, and an assessment in which they were asked to manipulate nonsense words. All three bilingual groups outperformed the monolingual students in all three areas. Additionally, the Spanish-speaking bilingual students outperformed the other two bilingual groups. Based on these results, Barac and Bialystok (2012) concluded that bilingual students have developed higher levels of linguistic awareness than their monolingual peers.

Strong thinking skills and creative thinking were also identified as benefits of becoming bilingual (De Jesus, 2008; Leikin, 2012; Zelasko & Antunez, 2000). In her study with students

in Puerto Rico who participated in two-way dual language instruction, De Jesus (2008) found that bilingual students demonstrated higher order thinking skills more often than did their monolingual peers. In addition, bilingual students tended to use inferential reasoning more often than did their monolingual peers. The work of Zelasko and Antunez (2000) supported these findings. In their study, Zelasko and Antunez found that bilingual students demonstrated greater facility in understanding mathematical concepts and using problem-solving skills. In his study, Leikin administered two assessments to three groups of bilingual children. Two of the groups in the study were bilingual and one group was monolingual. The first assessment given to the children was a multiple solution task on creativity. The second assessment was an equal number task on mathematical creativity. The bilingual students showed more creativity in both tasks and outperformed their monolingual peers (Leikin, 2000).

Barac and Bialystok (2012), De Jesus (2008), and Zelasko and Antunez (2000) found additional benefits of being bilingual to be stronger memory skills and executive functioning skills. De Jesus (2008) equated the brain to a muscle that must be exercised. Children learning in two languages are continually exercising their brain, which leads to stronger memory abilities than their monolingual peers. Zelasko and Antunez (2000) found that bilingual students demonstrated better self-control and executive functioning skills, meaning that bilingual children were better at planning, time management, and multitasking. Barac and Bialystok found through the administration of an assessment that required students to plan a solution for the organization of blocks, the bilingual students tended to persist in the task longer than did their monolingual peers. Bilingual students were also more systematic in planning an approach to the task (2012).

Thomas and Collier (2003b), Christian et al. (2000), De Jesus (2008), and Zelasko and Antunez (2000) each addressed the cultural awareness of bilingual students. Thomas and Collier

(2003a) indicated that language majority students participating in two-way dual language instruction expanded their worldview and gained an added respect for all cultures—not just that of the minority language. Additionally, the researchers contended that for the language minority students, participation in a two-way dual language program created an atmosphere of inclusion in the experiences and the world of their language majority peers. Christian et al. found that two-way dual language programs promoted positive relationships across cultures. Students who participated in these programs exhibited not only positive attitudes about the second language they were learning, but positive attitudes in relationship to their peers from the new culture (2000). De Jesus (2008) indicated that participants in the program in her study reported being more appreciative of diversity and better understanding the culture of their peers. Zelasko and Antunez (2000) contended that bilingual children developed a better sense of self, were more apt to seek information in more places, showed a desire to learn about diverse people, and were better prepared to participate in a global society.

The Opposing View

Although the vast majority of available research spoke favorably about bilingual education and dual language programs, a smaller body of work exists that questions the effectiveness of bilingual programs. Conger (2010) questioned the effectiveness of bilingual programs, stating that his research showed that ELL students in dual language programs tended to linger longer in their heritage language and learned English more slowly than did ELL students who were immersed in English. He cited the academic success of Asian students in the United States who were not often offered instruction in their heritage languages as a counter example to the success of bilingual programs for Hispanic or Latino students.

Conger (2010) concluded that dual language programs may not be more effective than pullout programs. His research was conducted in New York City schools and showed that during the first year of participation in a bilingual program, students only made minimal gains in academics, and students' gains were even more insignificant the subsequent year. It is important to note that his research did not mention what happened beyond the third year. Conger (2010) made the case that if bilingual education were truly effective, Hispanic children would be outperforming Asian children, as Hispanics received more native language instruction than any other language minority group.

Further questions about the positive effects of dual language programs have been discussed (Pimentel et al., 2008). Based on the research of Pimentel, Soto, Pimentel, and Urrieta, there was a question if dual language programs truly benefitted all participants. Their work claimed that it was a matter of power (2008). Even though bilingual programs strove to create an environment of equity, the expectations were not equal. In support of their claims, the authors quoted Valdes (1997) as saying, "For minority children, the acquisition of English is expected. For mainstream children, the acquisition of a non-English language is enthusiastically applauded" (p. 206). The authors went on to state that for English speakers, dual language instruction was an enrichment program that was a choice. However, for non-English speakers, dual language instruction was a treatment, which they were required to enroll in by the state or the district.

While other researchers have not questioned the complete validity of bilingual education for ELL students or even native English speakers, they have questioned the strategies and intent of the program. Hadi-Tabassan (2005) cautioned against code-switching or using both languages similtaneously to convey a message. She believed that code-switching led to language confusion

and created individuals who cannot meet the linguistic norms of either language. She also expressed concern that within the classroom structure of a dual language program, the tempation to translate was great. She cautioned that consecutive translation, making a statement in one language and then repeating it in another, led to students waiting to hear instruction in their prefered langauage. Consecutive translation led to lost opportunities and lost instructional time.

Scanlan and Palmer (2009), questioned the consideration of race and power in dual language instruction. They believed that dual language programs created inequity for language minority students and that the power was given to the language majority students. These researchers believed that minority students become a means to an end for majority students and that dual language instruction provides a greater benefit for the majority students. Honigsfeld (2009) cautioned against the overexhuberance to implement dual language programs without carefully considering if the program model met the needs of the target population. Scanlan and Palmer (2009) argue that too often the target population becomes the majority students and that not enough consideration is given to the education of the minority student.

Varghese and Park (2010) do not oppose bilingual education in and of itself, but question if the original commitment and intent of bilingual programs has been lost by the creation of dual language programs that often are present as an avenue to greater global opportunities. They raise concerns that dual language instruction has changed the purpose of bilingual education from providing minorities with an equal opportunity to education, to using language as a commodity for majority students participation in globalization. Additionally, Varghese and Park (2010) are critical of dual language programs positing that even though such programs teach a minority language, they do so through the cultural lens of the majority population. Lastly, they question the manner in which dual language programs teach language. The authors claim that these

programs teach the minority language with an emphasis on communication, while teaching the majority language with an emphasis on academics. Varghese and Park (2010) point out that even though students are participating in instruction in two languages, high-stakes academic testing is conducted only in the majority language.

Conclusion

In the field of bilingual education, there exists a significant body of work that explores its history, defines the program models, posits theories, and presents evidence of its effectiveness. History has shown over time that the apprehensions about teaching and learning in a language other than English have not changed much. However, scholars persist in exploring bilingual education and dual language instruction, continually adding to the body of work. Much of what has been written speaks favorably about bilingual and dual language instruction. There has been considerable research demonstrating that dual language education is beneficial for both language majority and language minority children. The research also explored in-depth factors that are essential in implementing and sustaining a successful program. When dual language programs were implemented well, the research demonstrated that participants could attain high-academic achievement. Additionally, the research addressed social and cultural issues, such as the importance of parental involvement and the benefits of becoming bilingual.

This review did not include all that has been written and published addressing bilingual education and two-way dual language instruction. It did present a comprehensive sample of the research conducted in the field. Moreover, it explored the works of those researchers who are considered to be the leading experts in bilingual and dual language education. This review included literature from multiple sources, including books, articles, abstracts, documents,

electronic items, dissertations, and other resources from which information and understanding might be obtained.

In subsequent chapters, the design and methodology of the study will be outlined in detail. The results will be discussed and illustrated using tables and figures. Additionally, the outcomes of the study will be discussed in relation to this literature review, and areas of further research will be outlined.

Chapter III

Design and Methodology

The Design Vignette

Mrs. Franco stood in line with her students listening to them chitchat as they waited for their turn at the salad bar. Some of her students waited more patiently than others.

"Miguel, ponte bien en la línea. ¡No estés jugando! Te vas a lastimar." Why did it seem that she always had to remind Miguel to behave and not resort to horseplay in the lunch line? Part of the reason that eating lunch with her class had become a daily ritual was so that she could keep an eye on Miguel. Maybe someday her efforts would be rewarded and Miguel would walk through the lunch line without poking anyone in the ribs.

In the meantime, she would enjoy the silver lining, which came in the form of sharing lunch with her students. This year she had built a rapport with her students unlike any year before. She guessed she had Miguel to thank for that. Today she found herself sitting next to David. David reminded her of an old man trapped in a third-grader's body. He was often pensive, sometimes silly, and really enjoyed telling the types of jokes that usually came from a grandpa. "¿Cómo te va, David?" She asked him.

"Not bad. The older ticker is still tickin', so I'm good."

"David, you don't have an old ticker—you're only eight."

"I know," he answered, just before taking a bite of a bologna sandwich. He chewed a little and gulped it down. "Mrs. Franco? I was thinking the other day. We spend a whole lot of time learning in Spanish, but I really don't know Spanish."

Mrs. Franco looked at him a little confused. Before she could say anything, David continued, "I mean, I can tell you about community helpers, ten frames, and the life cycle of a

frog in Spanish, but I couldn't tell you what I did this weekend. I'm learning science and math and stuff, but I'm not really learning to speak in Spanish."

Mrs. Franco didn't know quite what to say to David. "You make a very good point, David. I'm going to have to think about that and get back to you," she responded to him after a moment of reflection.

At the next staff meeting, Mrs. Franco shared David's concern with the staff. The seemingly ordinary day in the cafeteria led the staff to carefully examine their approach to dual language instruction. Prior to that day, the only guiding principle had been that the school employed an 80:20 model. David's comment brought to light for the teachers that teaching in a dual language setting required so much more than just a ratio of Spanish to English.

As the principal of a dual language school, I am continually examining teaching and learning and inviting teachers to join me in the analysis. From David's observation, we learned that it wasn't enough to simply say, "We are a dual language school." David's comment guided us to carefully consider what our school should look like beyond time limits. We identified factors that needed to be in place to support student learning, and we have become very systematic and intentional in the delivery of instruction in both English and Spanish. We continue to actively search out the best practices and seek to know if our efforts are yielding the best results for our students.

Introduction

The purpose of this study was to determine the effectiveness both academically and linguistically of the dual language at Los Campos Dual Language Magnet School. Los Campos implemented a two-way dual language program in the fall of 2007. The first cohort of students completed the program, from kindergarten through fifth grade, in the spring of 2013. This study

examined if the program at Los Campos met two of the three goals of bilingual education, namely high-academic achievement and bilingualism.

The study was guided by a grand tour research question: Is there a statistically significant difference in the achievement, both academically and linguistically, of the students at Los Campos as compared to like peers from their neighborhood schools?

The following subquestions provided the necessary information to answer the grand tour research question:

1. How do the students of Los Campos compare academically to like peers at their neighborhood schools as measured by the SSAT?
2. How do ELL students at Los Campos compare to like peers at their neighborhood schools as measured by the SSAT?
3. How do ELL students at Los Campos compare to like peers at their neighborhood schools in English acquisition as measured by the SELA?

Research Design

This study used quantitative methods to analyze numerical variables with statistical measures to determine if predicted generalizations were true (Creswell, 2008). The data analyzed in this study was ex post facto test data. Ex post facto research can be used when studying two groups that are similar to each other, but one group is subject to a treatment or condition that varies from the other group (Cohen, Manion, & Morrison, 2011).

This study employed a matched-pair comparison of the fifth-grade students from Los Campos Dual Language Magnet School, a rural, two-way dual language school in the Western United States, and like peers from their neighborhood schools. A comparison of academic achievement and linguistic achievement was made. This study used ex post facto data from

standardized state testing to determine if there was a statistical difference in the academic achievement of students who participated in the two-way dual language program at Los Campos and other students within the same school district. Ex post facto data from standardized state testing on language acquisition were used to determine if a difference existed in the English language acquisition of ELL students at Los Campos as compared to other ELL students within the school district. In addition, the researcher applied data from the school district's database to conduct statistical analysis for the purpose of determining if a significant statistical difference existed as a result of participating in the dual language program at Los Campos.

To determine the academic effectiveness of the dual language program at Los Campos, a comparison of students' fifth-grade scores on the state standardized test was conducted for each matched pair. Academic areas analyzed were reading, language, math, and science. Additionally, students' language acquisition was studied. Unfortunately, monolingual English students were not tested upon their enrollment at Los Campos to determine their initial Spanish language skills, if any. The students attending their neighborhood schools had not received Spanish language instruction. Therefore, a matched-set comparison could not be applied to determine the linguistic effectiveness for initially monolingual English speakers. Fortunately, native Spanish speakers were assessed for English language skills when they enrolled at Los Campos. Likewise, their peers at their neighborhood schools were assessed using the same assessment—the SELA. A matched comparison was made of students' progress in English language acquisition.

The research hypotheses for this study were:

1. Fifth-grade students who have participated in two-way dual language instruction at Los Campos Dual Language Magnet School will attain the same or higher levels of

academic achievement as measured by state standardized testing as compared to like peers from their neighborhood schools.

2. Fifth-grade students who were identified as ELL or LEP in kindergarten and who have participated in two-way dual language instruction at Los Campos Dual Language Magnet School will attain the same or higher levels of academic achievement as measured by state standardized testing as compared to like peers from their neighborhood schools.
3. Fifth-grade students who were identified as ELL or LEP in kindergarten and who have participated in two-way dual language instruction at Los Campos Dual Language Magnet School will attain the same or higher levels of English language acquisition as measured by state standardized testing as compared to like peers from their neighborhood schools.

The alternative hypotheses for this study were:

1. Fifth-grade students who have participated in two-way dual language instruction at Los Campos Dual Language Magnet School will not attain the same or higher levels of academic achievement as measured by state standardized testing as compared to like peers from their neighborhood schools.
2. Fifth-grade students who were identified as ELL or LEP in kindergarten and who have participated in two-way dual language instruction at Los Campos Dual Language Magnet School will not attain the same or higher levels of academic achievement as measured by state standardized testing as compared to like peers from their neighborhood schools.

3. Fifth-grade students who were identified as ELL or LEP in kindergarten and who have participated in two-way dual language instruction at Los Campos Dual Language Magnet School will not attain the same or higher levels of English language acquisition as measured by state standardized testing as compared to like peers from their neighborhood schools.

Participants

The participants in this study were students of Los Campos who had been enrolled in the school from kindergarten through fifth grade and their like peers from 15 other elementary schools in the district who had been enrolled in their neighborhood schools from kindergarten through fifth grade.

The student population at Los Campos was not very transient, meaning few students moved out or moved in during the course of their elementary education. The same cannot be said of the neighborhood schools. This reduced the number of matched pairs in the study. To increase and ensure the validity of the study, consistency in treatment of the educational program received by the participants in their neighborhood schools, as well as those at Los Campos, was maintained. For that reason, students who did not begin and end their elementary education at the same school were excluded.

Data Collection

Students who participated in the two-way dual language program at Los Campos from kindergarten through fifth grade were identified. Matched pairs were identified by finding like peers from their neighborhood schools or the school that Los Campos students would have attended had they not enrolled at Los Campos. When making matched pairs, the following was considered:

- Gender
- Age
- Ethnicity
- Language dominance at the point of initial enrollment into kindergarten
- Students who had been identified as ELL (the state used the term LEP) as determined by the SELA were matched with other ELL students with as close to the same language acquisition level as measured by the SELA.
- Reading ability as measured by the state reading indicator in the fall of the student's kindergarten year. This was the first standardized academic indicator obtained upon entrance into kindergarten.
- Socioeconomic status as determined by free or reduced lunch status

The criterion for establishing the matched pairs was carefully selected for the purpose of strengthening the validity of the comparison. One variable that could not be accounted for, but should be considered is that the students of Los Campos attended the school by choice. As a magnet school, parents could choose to enroll their student at Los Campos. Enrollment at los Campos was not mandatory. Students at the neighborhood schools who chose not to enroll at Los Campos could not select which neighborhood school to attend. These students were obligated to attend the school assigned to the area in which they lived. This created a degree of self-selection of the participants. Additionally, to ensure that the results showed the effects of participation in a dual language program and not school site differences, information from each school site was considered. This information included:

- the curriculum materials used for teaching math, language, and reading,
- the teachers' number of years in the field, and

- the teachers' level of education.

In order to determine if statistical difference existed in the academic and linguistic achievement as a result of participation in the dual language program at Los Campos, the following student achievement data were compared:

- SSAT scores for fifth grade
- SELA scores for kindergarten and fifth grade

Student demographic data and student test data were obtained by the district's technology department through the district's database. This information was provided to the researcher with identification numbers only. The researcher was "blind" to any identifying data and could not link this information to any individual student. Data regarding the curriculum and teacher experience were collected at the district level by district personnel and provided to the researcher with the exclusion of names. The researcher could not link any information to individual teachers but was able to match the data to each neighborhood school.

Analytical Methods

When comparing matched-pair data, two commonly used tests were applied: a paired *t*-test and a Wilcoxon matched-pairs test (Tanner, 2012). A paired *t*-test is a parametric test designed to test two dependent samples. A Wilcoxon matched-pairs test is a nonparametric test also designed to test two dependent samples. The paired *t*-test analyzes interval data. The Wilcoxon matched-pairs test analyzes ordinal data (Tanner, 2012). The paired sample ex post facto data collected for this study were analyzed using a paired *t*-test. The data analyzed in this study were standardized test data, which were expected to be normally distributed; therefore, a parametric test provided a more robust statistical comparison. Additionally, the data analyzed in this study were considered to be dependent because pairs were closely matched (Tanner, 2012).

This parametric statistical test was best suited for demonstrating if a statistically significant diffference existed in the academic and linguistic achievement of Los Campos students and their like peers.

Limitations and Delimitations

Marshall and Rossman (2011) described limitations as "what the study is and is not—its boundaries and how its result can and cannot contribute to understanding" (p. 76). Therefore, limitations are the influences that cannot be controlled by the researcher. The authors continued describing delimitations as limitations purposefully used by the researcher to establish boundaries for the study.

In this study, limitations included the location of the school where the research was conducted, the sample size, the number of matched pairs allowed by the sample size, accessibility of data, and the inability to test for language acquisition in a pre-post fashion in that no assessment of the ability of native English-speaking students to speak Spanish was conducted at the onset of the program; therefore, no comparison was made after participation in the program.

Delimitations included placing the focus solely on the dual language program at Los Campos, concentrating only on academic achievement and language acquisition for ELL students and not on developing positive cultural attitudes or parental perspectives. Other delimitations included the factors and number of factors considered for establishing pairs, as well as utilizing state standardized assessments.

Role of the Researcher

Because the researcher had a close connection to Los Campos during the study, she took extraordinary care to maintain ethical standards throughout the study by establishing a personal

protocol that limited her access to participant identification data, which included following steps adapted from Drew, Hardman, and Hosp (2008):

1. The researcher exercised caution to ensure there is no exploitation for personal gain.
2. The researcher avoided any influence over subordinates or others.
3. The researcher remained sensitive to the integrity of ongoing institutional activities (p. 60).

While the very nature of quantitative research affords some anonymity of participants and distance between researcher and subjects and setting, this study required additional precautions by the researcher in terms of her relationship to Los Campos, which provided the study's treatment. The researcher was again guided by Drew et al. (2008) and gave special attention to the following ethical principles:

1. The researcher ensured self-disclosure of her researcher role to professionals and parents (p. 69).
2. The researcher avoided any manipulation of the treatment program.
3. The researcher resisted any data alteration (trimming or cooking) that smoothed irregularities (p. 75).

In summary, the researcher was acutely aware of the need to maintain the highest levels of integrity during the study. The researcher's unique educational qualifications helped with rigorous ethical research standards. The researcher has over 20 years of experience in bilingual education and second-language acquisition, having taught in several dual language schools in two different states, and she is currently the principal of a dual language school. She holds degrees in bilingual education and in teaching languages. She was a U.S. Department of Education Office of English Language Acquisition doctoral fellow and completed all course

work towards that degree in bilingual education. She has been an instructor within a bilingual teacher educational program at the university level. She has served as a reader and evaluator of grant proposals for the U.S. Department of Education, and she has been an evaluator of federal bilingual grant programs at two universities.

The researcher was also guided by ethical standards required by the Northwest Nazarene University Institutional Review Board, the participating school district policies, and the State Department of Education rules. She acted in an ethical manner at all times and followed established protocols to obtain the necessary state data.

Protection of Human Rights and Approval

Northwest Nazarene University Human Research and Review Committee granted approval of this study on April 14, 2013. This study did not involve human subjects and, therefore, was exempt from the protocols and precautions typically put into place when conducting human research. The study involved analyzing anonymous ex post facto student test data in which not even the research could link the results to individual participants' identities. However, the researcher was mindful of her role in the study's setting and took precautions to safeguard ethical standards. The safeguards were reviewed and outlined in Chapter 3, pages 42–43.

Conclusion

The design for this study was carefully considered. A significant part of the design was using matched pairs. The researcher planned a study that examined if the students of Los Campos compared academically and linguistically to like peers at their neighborhood schools. The researcher sought to account for as many variables as possible in the matching criteria in order to strengthen the validity of the results. The researcher used ex post facto test data that

could be gathered through the district database with minimal disruption, if any, to the work responsibilities of district personnel. The researcher carefully considered the analysis that was used to examine the data. While other tests were considered, ultimately the researcher selected the test that would provide the most robust results. The research carefully identified delimitations that would make the study manageable, in addition to identifying the limitations of the study that would possibly affect its outcomes. Lastly, the researcher was highly aware of her role as the principal of the school in the study. Every precaution was taken to protect the participants and protect the integrity of the study.

The subsequent chapters will outline the data analysis and present the test results. The concluding chapter will discuss the implications of the results and their direct applications to the setting in which the study was conducted.

Chapter IV

Results

The Data Vignette

Leonard cleared his throat, again, for the third time trying to get everyone's attention. Seriously, *he thought to himself*, principals make the worst students! *He held his hand high up in the air, fingers spread wide and counted down, "Five, four, three…" With each number he put a finger down. First one principal noticed and took her seat. As if in a chain reaction, gradually all the others followed suit. Eventually, the conversations went from loud exuberance to a hurried whisper.*

"Today we are going to use our time to review the results of our recent District-wide Math Screener." Leonard walked around the table and handed each principal a sheet of paper with the results of the district-wide math assessment completed two weeks prior.

As he moved around the room, he continued explaining, "As you know, we have agreed as a district to focus on data-driven instruction. As you get your copy…" Leonard looked up. He sighed. It really didn't matter much what he said now. No one was really listening. Immediately upon receiving a copy, each principal automatically scanned the page for the name of his or her school. Leonard studied the faces of each principal. Some faces showed cool satisfaction, a few faces beamed with surprise, and yet other brows wrinkled with concern.

"Now that you've had a moment to look over the results, please take some time to look at them more carefully. It's okay to look beyond your own scores. Is there anything that stands out to you? What do these results tell you about teaching and learning math in our district? What notes should we include in our next report to the superintendent?" Leonard patiently waited, but the silence just hung in the air. "Now they decide to be quiet!" He thought to himself.

Finally, the principal from Patriot Elementary, a tall, gray-haired and bearded man, who could most accurately be described as a modern-day hippie in his crisp pinstriped button-up shirt and bright blue silk tie, spoke up, "Well, I'd like to know what went wrong at our school, 'cause we stunk! But what I really want to know is how the dual language school manages to teach the majority of the time in Spanish and still get these types of results on a test conducted in English? You guys rocked!"

"Brain plasticity brought about by bilingualism!" replied the dual language school's principal.

As the principal of a dual language school, I am always pleased when I see results from district testing that ranks our school above the district average. I am certain as I spend time in classrooms with our students and teachers that our approach to instruction is not only sound, but that its benefits will serve our students long into the future. In a system that is so driven by data, seeing the results of our efforts so clearly stated adds validity to what we believe as a school and as a dual language community to be true.

Introduction

This research study examined if there was a statistical difference in the academic and linguistic achievement of a group of students who attended a two-way dual language school from kindergarten through fifth grade, as compared to like peers who attended their neighborhood schools. The research was guided by the grand tour question: Is there a statistically significant difference in the achievement, both academically and linguistically, of the students at Los Campos as compared to like peers from their neighborhood schools?

To answer the grand tour research question, it was necessary to look at more specific subquestions. The three subquestions were:

1. How do the students of Los Campos compare academically to like peers at their neighborhood schools as measured by the SSAT?
2. How do ELL students at Los Campos compare to like peers at their neighborhood schools as measured by the SSAT?
3. How do ELL students at Los Campos compare to like peers at their neighborhood schools in English acquisition as measured by the SELA?

Because this study was a quantitative comparison of students' achievement between Los Campos and other neighborhood schools in the same district, matched student pairs were used. The matched-pairs design was chosen because it minimized differences between groups (Tanner, 2012) and allowed for a more robust statistical comparison of the student achievement. This made the criterion for matching student pairs critical to the validity of the data. The criterion used to determine the pairs was set forth in the previous chapter. The table containing the matched-pair data can be found in Appendix A.

The test data analyzed were for the academic year 2012–2013. In that year, Los Campos had 82 fifth-grade students. However, a reduction of possible pairs was necessary for the following reasons:

1. Thirteen of those students were eliminated from the study because they did not attend the school from kindergarten through fifth grade or they were on an individualized educational plan and were receiving special education services.
2. Eight students were not included in the study because the corresponding neighborhood school failed to submit data regarding its students; therefore, matched pairs could not be made.

3. An additional eight students were eliminated from the study because matched pairs could not be established based on the identified criterion.

Pairs were established with a minimum of three "like factors," which followed a 3-step protocol:

1. It was required that gender, ethnicity, and language dominance be an exact match in order for two students to be paired.
2. Age was considered because it was possible to have students in the same grade who were a year or more apart in age. In considering age, students who were within 6 months of each other were considered to be a match.
3. State reading indicator or SELA scores were considered and students were only paired if their scores were within one rank of each other.

Based on these criteria and with the elimination of the students outlined, 53 matched pairs were established.

Table 6

Demographics of Study Participants

***N* Pairs = 53**		
Variable Description	**Number of Pairs**	**Percentage**
Male	22	41.5%
Female	31	58.5%
Caucasian	26	49%
Hispanic–Latino	26	49%
African American	1	2%
English Dominant	36	68%
Spanish Dominant (ELL)	17	32%

A background review of the demographics of this study was developed to help understand the make-up of the participants. In this study, there were more female matched pairs than male matched pairs. Caucasian and Hispanic–Latino matched pairs were evenly distributed with 26 matched pairs in each group. There was only one pair that was neither Caucasian nor Hispanic–Latino. While the Caucasian and Hispanic–Latino groups were equal, this did not have a direct correlation with language dominance. Nine of the Hispanic-Latino matched pairs were English dominant. All of the Caucasian matched pairs were English dominant in this study. The 17 Spanish dominant matched pairs were all identified as ELL by the SELA.

In Chapter 3, socioeconomic information was identified as one of the factors to be considered when establishing pairs. The only data maintained by the school district specific to students' socioeconomic status was student participation in the free or reduced lunch program, which was determined by the household income. Due to restrictions placed on the disclosure of information identifying individual students participating in the free or reduced lunch program by the Family Education Rights and Privacy Act of 1974, the district was unable to release this information. However, the district was able to provide group specific information about the participants in the study according to the school students attended.

The data in Table 7 shows the percentage of students participating in this study who participated in the free or reduced lunch program. Because the free or reduced lunch data was not student specific, it was not used as a factor for establishing matched pairs in this study. However, research (Jensen, 2013; Payne, 2005) indicated that poverty has a direct impact on education. For this reason Table 7 was included for descriptive purposes and in anticipation of reader interest in socio-economic status of participating schools. The data provided a socioeconomic overview by whole groups and by individual schools. Los Campos students were closely matched to the students from the neighborhood schools as a group, but were not always closely matched at the individual school level as illustrated by socio-economic status data.

Table 7

Percentage of Study Participants Receiving Free or Reduced Lunch

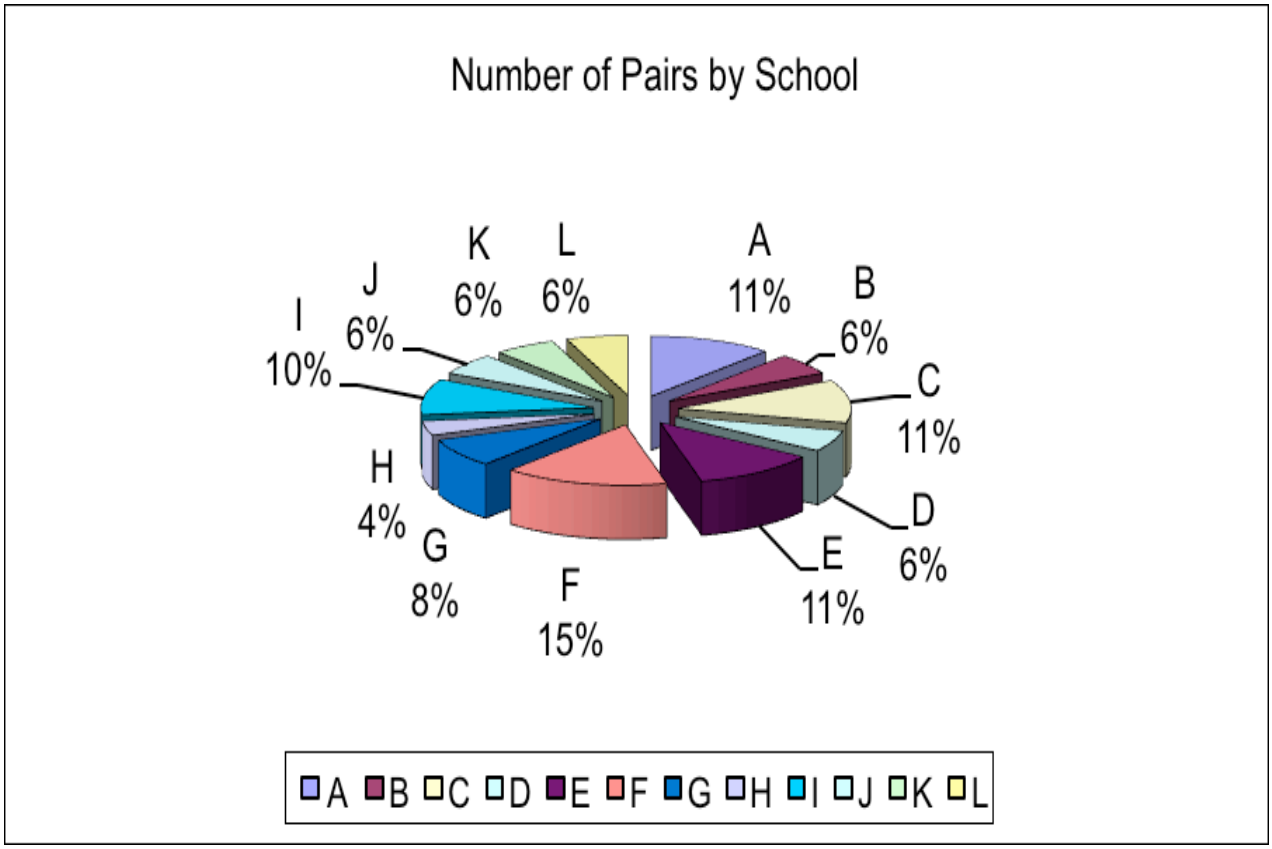
Groups/Schools	Los Campos	Neighborhood School
Total Group	47.1%	45.2%
A Elementary	16.6%	66.6%
B Elementary	66.6%	100%
C Elementary	83.3%	50%
D Elementary	0%	66.6%
E Elementary	50%	16.6%
F Elementary	37%	12.5%
G Elementary	75%	50%
H Elementary	50%	100%
I Elementary	16.6%	0%
J Elementary	33.3%	33.3%
K Elementary	66.6%	66.6%
L Elementary	100%	100%

During the 2012–2013 school year, there were 15 elementary schools in Los Campos' school district. Thirteen of those schools participated in this study, including Los Campos. One school did not participate because it opened in the 2009–2010 school year. This school did not have any students who had attended the school from kindergarten to fifth grade. This was one of the criteria for inclusion in the study. The other school was not included because it failed to provide data for the study. Figure 2 shows the distribution of the matched pairs by neighborhood

schools. The participating neighborhood schools were labeled A Elementary– L Elementary. This figure shows that the number of matched pairs was distributed throughout all of the neighborhood schools in the district.

Figure 2

Distribution of Matched Pairs by Neighborhood Schools



In addition to student demographic factors, the study considered school site factors for the purpose of strengthening the validity of the study by eliminating or accounting for as many variables as possible. The school site factors included curriculum employed, the teachers' number of years in the field, and the teachers' level of education. Data regarding these factors were to be collected and provided by the district.

The district provided information regarding the curriculum adoptions for the district. The current adoption for reading and language arts is *Open Court* (SRA–McGraw Hill, 2002). While

the district had a district-wide adoption, many schools were supplementing the Open Court program with multiple research-based strategies, intervention programs, and other reading programs. The science adoption was *Science* (Houghton Mifflin, 2007). The math adoption was *Envisions Math* (Pearson-Scott Foresman, 2009). However, the district strongly encouraged teachers and school administrators to transition from *Envisions Math* to math units of study that supported the Common Core. This directive was made without providing a unified curriculum. Schools throughout the district moved to implementing the Common Core in math at differing degrees of intensity. Based on the inconsistencies in curricular materials, the lack of teacher experience data, and teachers' level of education data, those factors were not considered in the analysis of data.

The district's extraordinary financial crisis. The district was not able to provide information regarding staff service and education. At the time the study was being conducted, the district was in the midst of a severe financial crisis, which made it impossible for the district to balance its budget. The consequences included a resignation by the superintendent and business manager. In order to balance the budget, the district had to make significant budget reductions in all categories. In terms of personnel, the district reduced 200 staff via attrition. Due to the significant loss of personnel at the conclusion of the 2012–2013 school year and an influx of new personnel, thanks largely to voter support for the extension of existing taxes, the district office was unable to provide the data requested.

Results

Research subquestion 1. How do the students of Los Campos compare academically to like peers at their neighborhood schools as measured by the SSAT? The data being analyzed in this study were ex post facto state test data. The table with the raw scores for each

student can be found in Appendix B. The state test data were provided by school district personnel using only identification numbers to maintain the privacy of the students in this study. Once students were matched based on demographic information, the identification number for each student was replaced by a pair number and letter identifying the neighborhood school. Students from Los Campos were assigned the same number as their like peers and identified by "LC."

The students were compared in four subject areas: reading, language usage, mathematics, and science. These were the four subjects measured on the SSAT. The state maximum and minimum scores for the test were as follows:

Table 8

SSAT Score Scale

Reading	**Math**	**Language Usage**	**Science**
0–257	0–250	0–257	0–241

This test was given electronically and scored as it was submitted. If a student reached the end of a given section with a high or perfect score, then supplemental questions were given, so it was possible for a student to score higher than the maximum scored listed in Table 8. In this study, only one student's score surpassed the maximum score.

Figure 3

Mean SSAT Scores Compared to Maximum Scores

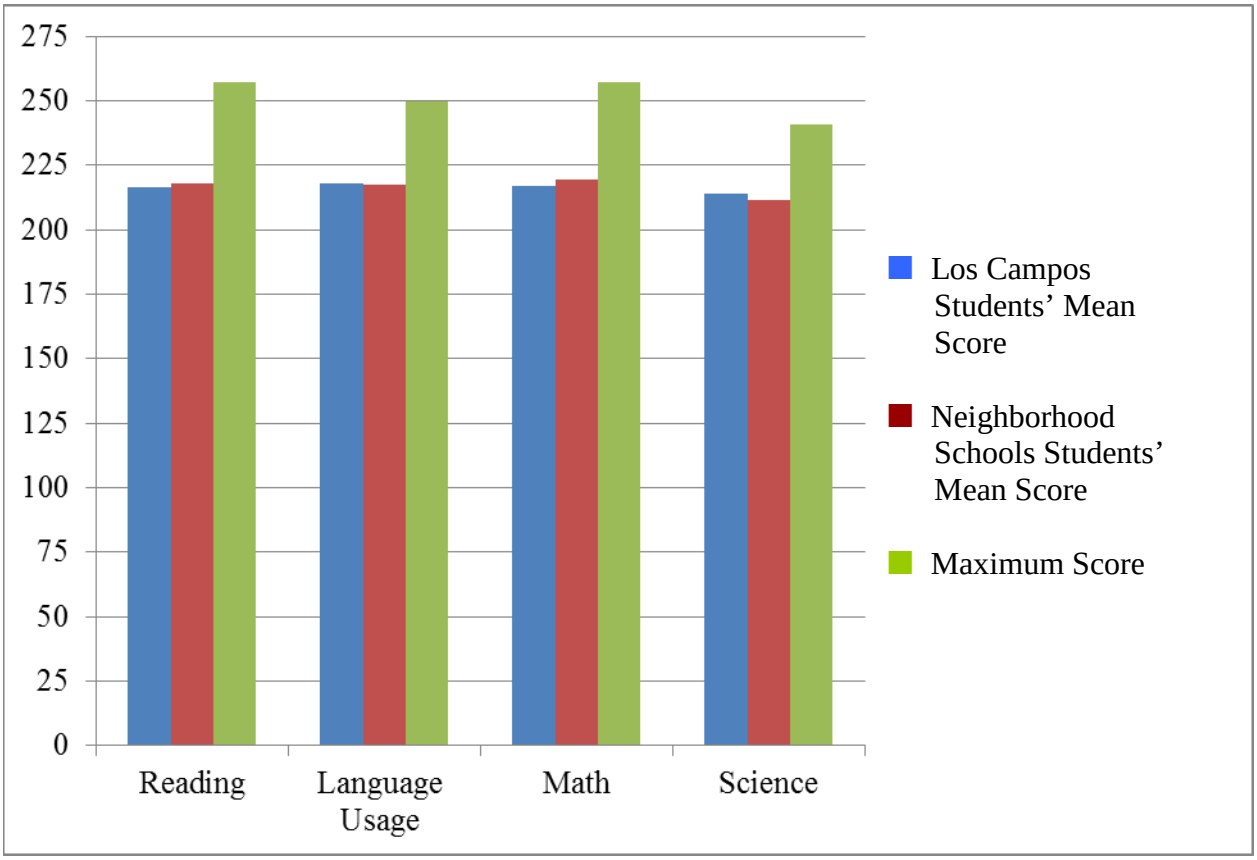


Figure 3 provides an overview of the mean scores for Los Campos and the neighborhood schools, as well as a comparison to the maximum score in each academic area assessed by the SSAT. The data show that the students at Los Campos scored slightly higher than their neighborhood school peers in language usage and science and slightly below their peers in reading and math. The information in Table 9 shows that both Los Campos and the neighborhood schools reached the level of proficient in reading, language usage, math, and science.

Table 9

Proficency Levels for SSAT

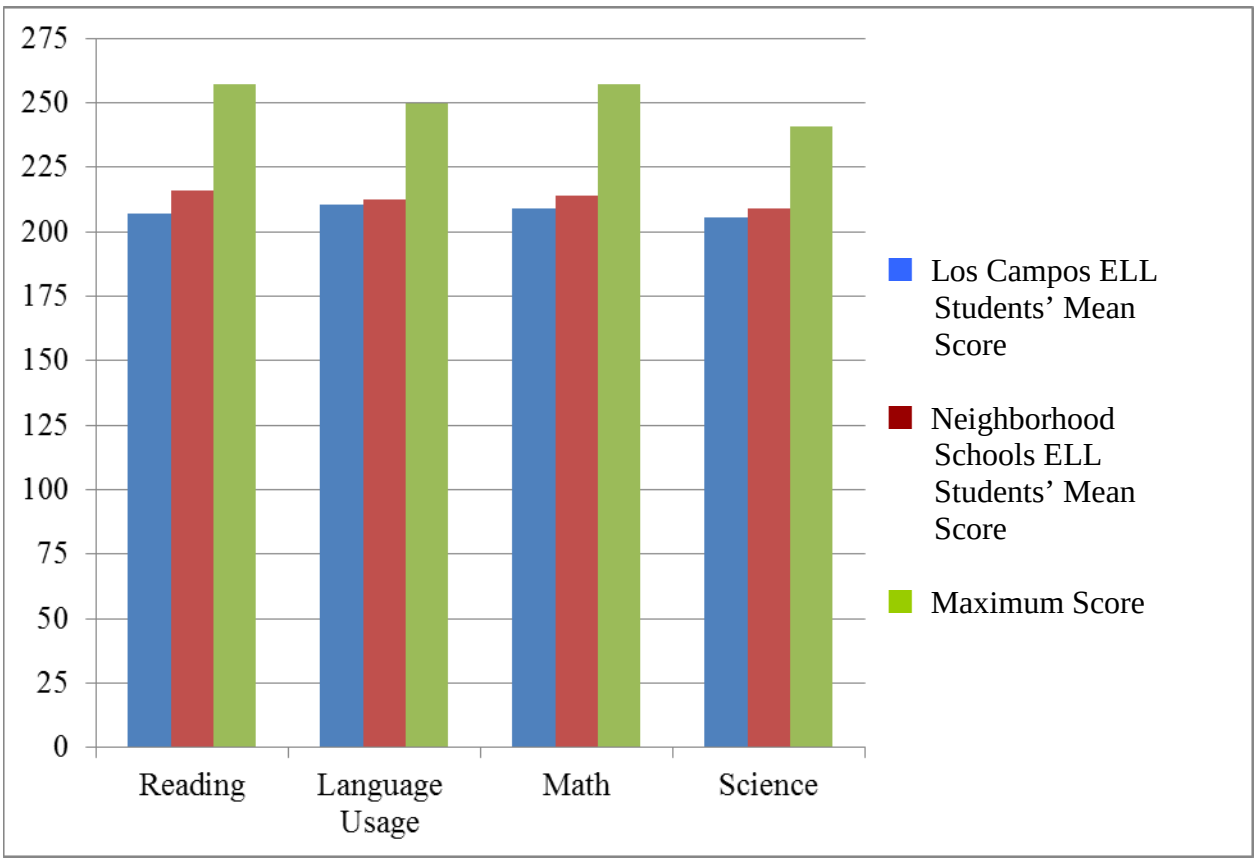
Proficiency Level	Reading	Language Usage	Math	Science
Advanced	> 218	> 221	> 223	> 215
Proficient	204–218	209–221	211–223	206–215
Basic	197–203	201–208	202–210	194–205
Below Basic	< 197	< 201	< 202	< 194

The information in Table 9 shows the scores students must obtain to reach specific levels of proficiency in each academic area tested. As whole groups, neither Los Campos nor the neighborhood schools scored at the advanced level. However, the raw data in Appendix B indicate that individual students from both groups scored at the advanced level in one or more academic areas.

Figure 4 provides an overview of the mean scores for Los Campos ELL students and ELL students at the neighborhood schools, as well as a comparison to the maximum score in each academic area assessed by the SSAT. The data show that the ELL students at Los Campos scored slightly lower than their neighborhood school peers in reading, language usage, math, and science. The information in Table 9 shows that ELL students at Los Campos reached the level of proficiency in reading, language usage, and science. Los Campos ELL students were one point below the proficient level in math. The ELL students at the neighborhood schools were proficient in reading, language usage, math, and science.

Figure 4

Mean SSAT Scores for ELL Students Compared to Maximum Scores



A matched-pairs *t*-test was used to determine the statistical significance of the two groups. The null hypothesis for the first subquestion in this study was:

> Fifth-grade students who have participated in two-way dual language instruction at Los Campos Dual Language Magnet School will attain the same or higher levels of academic achievement as measured by state standardized testing as compared to like peers from their neighborhood schools (H_o:μ1 = μ2).

The alternative hypothesis was:

> Fifth-grade students who have participated in two-way dual language instruction at Los Campos Dual Language Magnet School will not attain the same or higher levels of

academic achievement as measured by state standardized testing as compared to like peers from their neighborhood schools (H_a:$\mu 1 \neq \mu 2$).

These hypotheses were applied to all four of the subject test scores.

There were 53 matched pairs in this study, yielding 52 degrees of freedom (*df* = 52). Tanner (2012) described degrees of freedom as the number of scores in a group that can vary when the value of some related statistic is known. In other words, it is the total number of scores in a group minus one.

Using the Statistical Package for the Social Sciences (SPSS) software, the values for each pair were entered using the matched-pair design. In the accompanying tables, LC represents Los Campos and NS represents the neighborhood schools. While the tables in this chapter were not generated by SPSS, the data contained within Tables 5–27 were produced by SPSS software.

Prior to looking at the results from these tables, it is prudent to provide some explanation of the various columns of data in these paired *t*-test statistical tables. There are two tables included for each of the academic areas that were tested on the SSAT, and these were used to compare the Los Campos students' scores to the scores of their peers at the neighborhood schools. The first of these tables has some basic statistics for the paired samples. It includes the degrees of freedom, the mean for each group, and the standard deviation for each group. The second table contains the mean difference between the two groups, the standard deviation for all the paired samples, the upper and lower 95% confidence intervals, the calculated *t* value, the degrees of freedom, and the *p* value or significance value. When doing a paired *t*-test analysis, Tanner (2012) recommended using the calculated *t* value result and comparing this to the *t* value from Statistics Table B, otherwise known as the *t* table (Appendix D). If the calculated *t* result was less than the value from the *t* table, then the means would be considered statistically equal.

Stated in other words, any difference between the means of the two groups being compared is considered random variation and not significant enough to be considered a true difference. Conversely, if the calculated *t* value was greater than the value from the *t* table, then the means would be considered statistically different. In other words, the difference between the two means is too great to be considered purely random difference.

In this study the *p* value was used to determine statistical significance. If the *p* value was greater than .05, then the means would have been considered statistically equivalent. If the *p* value was less than .05, then the means would have been considered statistically different.

Although the *p* value was used to determine statistical significance for each comparison, the *t* value and the 95% confidence intervals could also have been used for comparison. To use the 95% confidence intervals, Tanner (2012) indicated that if the lower and upper confidence interval values surround 0 (zero), then the means are statistically equivalent. If the lower and upper confidence interval values are both above or both below zero, then the means would be considered statistically different. Because each of these three statistics were indicators of statistical difference between the means of the paired samples groups, all of them were included in the result tables and the results of the analysis are present in both *p* values and *t* values.

Table 10

Reading Score Statistics From SPSS

Paired Sample Statistics

Statistic	LC Reading	NS Reading
Number	53	53
Mean	216.453	218.057
Standard Deviation	12.587	10.347

Table 11

Reading Score Paired T-Test Results From SPSS

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC Reading– NS Reading	-1.604	14.128	-5.498	2.290	**-.826**	52	**.412**

It can be seen from the data in Table 11 that the significance or *p* value was .412. This was much higher than the .05 required to indicate that the two groups' scores were statistically equivalent. Therefore, the null hypothesis was accepted in this case. This meant the two groups' reading score means were statistically equivalent. This indicated that the students attending Los Campos scored as well in reading as their like peers or matched pairs who attended their neighborhood schools.

To compare *t* values it was necessary to first determine the level of significance from the *t* table. Using the *df* value of 52 and a *p* value of .05, the data from the *t* table indicated that the level of significance was 2.0066. The *df* value of 52 is consistent in Tables 11-17 so the *t* value of 2.0066 was used to determine the significance of the test result for each of these tables.

The SPSS results for reading revealed that $t = -.826$. It should be noted that the negative sign for the calculated *t* value was not needed when compared to the table *t* value. However, the sign indicated which of the two groups had the higher mean. A negative sign indicated that the mean of Group 1, Los Campos, was lower than the mean of Group 2, neighborhood schools. A positive *t* value would have been an indication that Los Campos had a higher mean than the neighborhood schools.

Because the calculated *t* value of 0.826 was < 2.0066, the result was not statistically significant (see Table 11). This was also verified by the 95% confidence intervals. The lower confidence interval was -5.498 and the upper confidence interval was 2.290. Because zero was between the lower and upper 95% confidence intervals, the two groups' means were statistically equivalent.

Table 12

Language Score Statistics From SPSS

Paired Samples Statistics

Statistic	LC Language Usage	NS Language Usage
Number	53	53
Mean	218.849	217.717
Standard Deviation	11.695	9.303

Table 13

Language Score Paired T-Test Results From SPSS

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC Language Usage– NS Language Usage	1.132	11.264	-1.973	4.237	**.732**	52	**.468**

The *p* value of .468 was greater than .05, which indicated the two means were not statistically different (see Table 13). The null hypothesis was accepted. The means of the two groups were statistically equivalent, or in other words, any variation between the two groups' means was considered normal variation. This also indicated that the students at Los Campos scored equally as well in the subject of language as their like peers who attended their neighborhood schools.

Once again, the 95% confidence intervals and the *t* value correlated with the *p* value as indicators of the equivalency of the two groups. The 95% confidence intervals were -1.973 to 4.237. These values surrounded zero, so the two groups' mean scores were statistically equivalent. The language results revealed that $t = .732 < 2.0066$, so the result was not significant.

Table 14

Math Score Statistics From SPSS

Paired Samples Statistics

Statistic	LC Math	NS Math
Number	53	53
Mean	217.113	219.585
Standard Deviation	14.211	11.730

Table 15

Math Score Paired T-Test Results From SPSS

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC Math–NS Math	-2.472	14.673	-6.516	1.573	**-1.226**	52	**.226**

The math score results revealed that the calculated *p* value was .226, which was greater than the .05 minimum to be considered statistically significant (see Table 15). Once again, the null hypothesis was accepted. There was no statistically significant difference between the Los Campos students and their like peers at their neighborhood schools. The two groups were considered statistically equal. However, when compared to the *p* values for reading and language usage, it was noted that the *p* value was smaller for the math score means. This was due to the mean math scores having a larger delta than those of reading and language usage.

When the *t* value statistic was used the calculated *t* value of -1.226 < 2.0066, thus the result was not considered significant. The 95% confidence intervals also indicated that the two means were statistically equivalent because they surrounded zero. However, the lower value of -6.516 was further from zero than in any of the previous paired *t*-tests, which also demonstrated that while not statistically different, the means of the math scores were farther apart than those of reading and language usage.

Table 16

Science Score Statistics From SPSS

Paired Samples Statistics

Statistic	LC Science	NS Science
Number	53	53
Mean	213.906	211.717
Standard Deviation	11.404	9.781

Table 17

Science Score Paired T-Test Results From SPSS

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC Science–NS Science	2.189	13.291	-1.475	5.852	**1.199**	52	**.236**

The results for science indicated that the *p* value was .236 which was greater than .05; thus, the result was not considered significant (see Table 17). The null hypothesis was accepted. The mean scores of the two groups were statistically equal. Furthermore, this demonstrated that the students at Los Campos scored equivalently with their like peers at the neighborhood schools on the science portion of the SSAT. The 95% confidence intervals of -1.475 and 5.852 surrounded zero, indicating that the mean science scores for the two groups were not statistically different from each other. Furthermore, the calculated $t = 1.199$ and was less than the 2.0066 value from the t table which was a 3rd indicator that the mean scores were not statistically different.

Based on these four subjects tested by the state, the study concluded that the students at Los Campos were academically equivalent to their peers at their neighborhood schools. The minor differences between the mean scores in each of the areas tested were not great enough to find that the two groups were different. The fact that Los Campos students had higher means on two subject areas and their like peers from their neighborhood schools were higher on the other two subject areas added credence that the two groups were statistically equal academically.

Research subquestion 2. How do ELL students at Los Campos compare to like peers at their neighborhood schools as measured by the SSAT? The data for the ELL students were actually a subset of the larger data set reviewed in response to research subquestion 1. Because ELL status was used as a criterion in determining matched pairs, the test results of those pairs were studied to answer research subquestion 2. However, there were only 17 ELL matched pairs as compared to the 53 pairs that were observed to answer the first question of this chapter.

The same paired sample *t*-test statistics were used to compare the ELL students at Los Campos with their like peers at their neighborhood schools. The scores for the four subjects—reading, language, mathematics, and science—tested by the state on the standardized test were used again for this analysis.

The null hypothesis for this subquestion was:

Fifth-grade students who were identified as ELL or LEP in kindergarten and who have participated in two-way dual language instruction at Los Campos Dual Language Magnet School will attain the same or higher levels of academic achievement as measured by state standardized testing as compared to like peers at their neighborhood schools (H_o:μ1 = μ2).

The alternative hypothesis was:

Fifth-grade students who were identified as ELL or LEP in kindergarten and who have participated in two-way dual language instruction at Los Campos Dual Language Magnet School will not attain the same or higher levels of academic achievement as measured by state standardized testing as compared to like peers at their neighborhood schools (H_a:μ1 ≠ μ2).

The data from Tables 18-25 answered research subquestion 2 posed in this section.

Table 18

Reading Score Statistics From SPSS for ELL Students

Paired Samples Statistics

Statistic	LC ELL Reading	NS ELL Reading
Number	17	17
Mean	207.235	215.765
Standard Deviation	6.978	9.846

Table 19

Reading Score Paired T-Test Results From SPSS for ELL Students

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC ELL Reading– NS ELL Reading	-8.529	10.596	-13.977	-3.082	**-3.379**	16	**.004**

The *p* value for the ELL reading scores was .004 (see Table 19). This was less than .05, which indicated that the difference between the groups' means was statistically significant. The null hypothesis was not accepted in this case. This meant the difference between the groups was too large to be considered a random variation. This indicated that the ELL students at Los Campos did not perform as well as their like ELL peers at their neighborhood schools on the

reading portion of the SSAT. The ELL students at Los Campos were not equal statistically to their like peers at their neighborhood schools.

Because this was the first comparison that was statistically significant in this study, it is important to look at the other indicators in the paired *t*-test results. The reading results had a calculated *t* value of 3.319 > 2.1199, thus this was considered a significant result. In addition to the *t* test and *p* value results, the 95% confidence intervals were -13.977 (lower) and -3.082 (upper). Because zero was not between these two interval values, the means were statistically different.

When the reading score means from both groups of ELL students in Table 18 were compared to the means of the larger group of all students in Table 10, the researcher found the ELL students' average scores were lower for both groups. In other words, the average reading scores for ELL students in this study were lower than the non-ELL students in this study, but the disparity was larger for the ELL students at Los Campos.

Table 20

Language Score Statistics From SPSS for ELL Students

Paired Samples Statistics

Statistic	LC ELL Language	NS ELL Language
Number	17	17
Mean	210.706	212.647
Standard Deviation	9.860	9.937

Table 21

Language Score Paired T-Test Results From SPSS for ELL Students

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC ELL Language Usage– NS ELL Language Usage	-1.941	12.059	-8.142	4.260	**-.664**	16	**.516**

Table 21 shows the calculated *p* value was .516 for the ELL Language scores; thus, the results of the language score comparison were not statistically significant. The null hypothesis was accepted in this case. The mean of the two groups was statistically equal. The ELL students at Los Campos were equal statistically to their matched ELL peers at their neighborhood schools. The 95% confidence intervals also indicated that the language usage mean scores of the two groups were statistically equal. The calculated *t* value of .664 < 2.1199 was a third witness to the equivalency of the two group means.

When the ELL paired *t* scores were compared to the larger group of all matched pairs, it was noted that the range between the 95% confidence intervals was larger for the ELL comparison. This was due to the sample size being smaller and, consequently, the degrees of freedom were smaller. This was a demonstration of how the sample size affects the robustness of a statistical comparison.

Table 22

Math Score Statistics From SPSS for ELL Students

Paired Samples Statistics

Statistic	LC ELL Math	NS ELL Math
Number	17	17
Mean	209.177	213.824
Standard Deviation	11.120	9.819

Table 23

Math Score Paired T-Test Results From SPSS for ELL Students

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC ELL Math– NS ELL Math	-4.647	13.541	-11.609	2.315	**-1.415**	16	**.176**

The results for math test scores revealed the *p* value of .176 was greater than .05, thus the result was not significant. The null hypothesis was accepted. The two group means were equal. This indicated that the ELL students from Los Campos scored equivalently well on the math portion of the SSAT as their like peers at their neighborhood schools. The calculated $t = 1.415 < 2.1199$, which corroborated with the *p* value statistic. The 95% confidence intervals once again contained zero between the upper and lower values, so all 3 statistics in table 23 indicated no significant difference between the means of the groups.

Table 24

Science Score Statistics From SPSS for ELL Students

Paired Samples Statistics

Statistic	LC ELL Science	NS ELL Science
Number	17	17
Mean	205.588	209.118
Standard Deviation	6.276	10.959

Table 25

Science Score Paired T-Test Results From SPSS for ELL Students

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC ELL Science– NS ELL Science	-3.529	12.904	-10.164	3.105	**-1.128**	16	**.276**

The *p* value calculated for science was .276, which was greater than .05; thus the mean difference was not significant. The null hypothesis was accepted. The mean science test scores were equivalent between the two groups. This indicated that the Los Campos ELL students performed as well as their ELL counterparts at their neighborhood schools. Once again, the *t* value and the 95% confidence intervals indicated the same thing as the *p* value comparison.

Looking at the four test scores compared in this section, the Los Campos ELL students scored statistically equal to the ELL students from their neighborhood schools in math, language usage, and science. Only the Los Campos reading scores failed to statistically match their ELL peers.

Research subquestion 3. How do ELL students at Los Campos compare to like peers in English acquisition as measured by the SELA? To answer this question, the same 17 matched pairs previously analyzed were examined again. However, this time they were compared only in English acquisition as measured by the SELA. This analysis was again a matched-pair analysis. The same *t* value of significance from Table B was used because the same 17 pairs were being compared.

The null hypothesis for this subquestion was:

Fifth-grade students who were identified as ELL or LEP in kindergarten and who have participated in two-way dual language instruction at Los Campos Dual Language Magnet School will attain the same or higher levels of English language acquisiton as measured by the SELA as compared to like peers at their neighborhood schools (H_o:μ1 = μ2).

The alternative hypothesis was:

Fifth-grade students who were identified as ELL or LEP in kindergarten and who have participated in two-way dual language instruction at Los Campos Dual Language Magnet School will not attain the same or higher levels of English language acquistion as measured by the SELA as compared to like peers at their neighborhood schools (H_a:μ1 ≠ μ2).

The SELA (Score Reports Interpretation Guide, 2013) detailed five levels of English proficiency and assessed the domains of listening, speaking, reading, writing, and

comprehension in grades K–12. All five language communication skills were evaluated to determine ranking or level of acquisition. The five English language development levels defined by the state were as follows:

Table 26

SELA Language Acquisition Ratings

Rating	Acquisition Level
1	Beginning
2	Advanced Beginning
3	Intermediate
4	Early Fluent
5	Fluent

The entrance and exit scores for both groups were compared to help answer the study research subquestion 3.

Table 27

SELA Entrance Score Comparison (Kindergarten)

Paired Samples Statistics

Statistic	LC Initial SELA	NS Initial SELA
Number	17	17
Mean	3.471	3.765
Standard Deviation	.874	.970

Table 28

SELA Entrance Score Paired T-Test Results (Kindergarten)

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC Initial SELA– NS Initial SELA	-.294	.919	-.767	.179	**-1.319**	16	**.206**

The *p* value calculated for incoming SELA scores was .206 and is greater than .05, so this result was not statistically significant. The null hypothesis was accepted. This indicated that students at Los Campos were equal to their like peers at their neighborhood schools in English language acquisition when starting in kindergarten. The 95% confidence intervals also demonstrated statistical equivalency because zero was contained between -.767 and .179. Finally, the *t* value of 1.319 was less than 2.1199 and also showed that the two group means were statistically equal.

Table 29

SELA Exit Score Comparison (Fifth Grade)

Paired Samples Statistics

Statistic	LC Fifth-Grade SELA	NS Fifth-Grade SELA
Number	17	17
Mean	4.529	4.294
Standard Deviation	.624	.985

Table 30

SELA Exit Score Paired T-Test Results (Fifth Grade)

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC Fifth Grade SELA– NS Fifth Grade SELA	.235	1.091	-.326	.796	**.889**	16	**.387**

The *p* value of .387 was > .05; thus, the result was not significant. The null hypothesis was accepted. The two groups were statistically equivalent on the SELA scores. The ELL students at Los Campos performed equivalently well on the SELA test as their like peers at their neighborhood schools. The *t* score of .889 was < 2.1199 which corroborated the *p* result. In addition, the 95% confidence intervals contained zero.

Closer inspection of the means between entrance and exit scores (see Tables 27 and 29) showed that Los Campos ELL mean scores increased from 3.471 to 4.529—an increase of 1.058. The neighborhood schools ELL mean scores increased from 3.765 to 4.294—an increase of 0.529. To determine if this score increase was significant, the improvement for each student was analyzed in another paired-*t* analysis.

Table 31

SELA Delta Score From Entrance to Exit Statistics

Paired Samples Statistics

Statistic	Delta 1	Delta 2
Number	17	17
Mean	1.058	.529
Standard Deviation	1.088	1.419

Table 32

SELA Delta Score Paired T-Test Results

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
Delta 1– Delta 2	.529	1.663	-.325	1.384	**1.313**	16	**.208**

The *p* value of .208 > .05, so the result was not significant. The null hypothesis was accepted. Even though Los Campos improved more on the SELA from entrance to exit, it was

not statistically significant. The study concluded that the ELL students at Los Campos were statistically equal to their like peers from their neighborhood schools with regards to the SELA test.

Summary of Results

Table 33 is a summary of the analysis conducted in this study. In all areas analyzed, there was not a statistical difference between Los Campos and the neighborhood schools with the exception of ELL reading. In this area, there existed a statistical difference between the scores of Los Campos and the neighborhood schools. The ELL students at the neighborhood schools performed better in reading than did the students at Los Campos. Los Campos students performed equally as well as the students in their neighborhood schools in eight out of the nine areas analyzed.

Table 33

Summary of Paired T-Test Results

Area Analyzed	Los Campos Statistically Equal to Neighborhood Schools	Los Campos Statistically Not Equal to Neighborhood Schools	Explanation of Statistical Difference
Reading	X		
Language Usage	X		
Math	X		
Science	X		
ELL Reading		X	Los Campos was statistically lower than the neighborhood schools.
ELL Language Usage	X		
ELL Math	X		
ELL Science	X		
ELL English Language Acquisition	X		

Conclusion

The statistical analysis conducted in this chapter showed that there was no statistical difference between the academic achievement of Los Campos students and that of like peers at their neighborhood schools in all areas with the exception of ELL reading. The data in Table 33 showed that the students of Los Campos Dual Language Magnet School scored equally as well as their like peers from their neighborhood schools in reading, language usage, math and science.

The data showed that ELL students from Los Campos did not score equally as well as their like peers in reading. The data showed that ELL students at Los Campos scored equally as well as their like peers from their neighborhood schools in language usage, math, science, and English language acquisition.

The final chapter of this study will provide a discussion of these results. The discussion will include making connections to the literature review, the positing of questions for further research, and stating implications for current practice.

Chapter V

Discussion

The Concluding Vignette

"Les quiero explicar cuanto he aprendido desde que empecé la escuela en un programa dual. En el primer día de kínder, solamente sabía como contar a diez. Ahora, yo puedo leer y escribir en español. Yo puedo hablar con mis amigos en español. Yo hablo en español con mi hermana que también va a la escuela dual y nuestros padres no saben que decimos. Yo tengo mucho orgullo por que las maestras en mi escuela me enseñaron español y yo lo puedo usar. Yo escribí esto sola, nadie me ayudó."

Camille cleared her throat and looked up from the paper she had been reading. Before her sat the school board, each member looked at her intently, some met her gaze with a smile; others had a look that was unreadable. Camille looked back at her paper. Suddenly, she became aware that not only did she have the board in front of her, but she was standing before a packed room with dozens of parents, students, and teachers sitting behind her. Her hands began to shake. She took a deep breath and began to read her statement again, but this time in English and with a slight quiver in her voice, "I want to explain to you how much I have learned since I began going to a dual language school. On the first day of kinder I could only count to 10. Now I can read and write in Spanish. I speak with my friends in Spanish. I speak in Spanish with my sister who also goes to the dual language school, and our parents don't know what we are saying. I am so proud that the teachers at my school taught me Spanish, and that I learned it. I was able to write this in Spanish; no one helped me.

Camille's arms dropped to her side, and as she looked up at the board, her bangs fell over her eyes. She pushed her blond hair back and then began to speak from her heart and not

from her script. "Por favor no quiten a mi escuela, yo amo mucho a mis maestras. En mi escuela yo tengo muchos amigos y en otra escuela no voy a aprender en español." Camille paused, but instead of translating for the school board she said, "Don't you wish you had a school like mine when you were a kid? Then you would know what I just said." The crowd behind Camille laughed, cheered, and clapped. The chairman of the board pounded his gavel on the table and called for order. When the room quieted down, Camille continued, "Please don't take my school away, I love my school, I love my teachers. In my school I have a lot of friends, and at another school I won't be able to learn in Spanish. I'm done." With that, Camille turned around and walked back to her seat as the crowd around her cheered.

The next speaker now stood before the school board. It was easy to see that he was overcome with emotion. He cleared his throat several times and wiped his hands on the sides of his well-worn jeans. "That was my daughter and I couldn't be prouder. I have no clue what she was saying half of the time, but I couldn't be prouder." He said in a choked voice. Again he cleared his throat and then continued, "I'm a simple gardener, but I work hard for my family so they can have the opportunities I didn't have. The dual language school gives my kids opportunities that I couldn't even begin to dream about. Please consider your actions tonight. Your decision has the potential of taking my kids' opportunities away."

As the principal of a dual language school, that night did not end the way I would have liked. Like many districts facing financial challenges, our district was faced with taking extreme and unpopular actions. Unfortunately, the dual language school was at the receiving end of some hard choices. But that night bolstered the commitment I have to dual language instruction. I walked away determined not to be defeated, but to find ways that all of our students could continue to reap the benefits of dual language instruction. I began to formulate a list of what

needed to be done at our school to ensure that the education provided within our walls not only met the expectation of that humble father who had spoken so eloquently on behalf of his children, but that it was truly based on best practices supported by research and that it would ultimately became an indispensable component of our district.

Introduction

Dual language programs have long been in existence in the United States (Baker, 2011; Crawford, 1999; Ovando & Combs, 2012). These programs are intended for both language minority and language majority students. The purpose of such programs is to provide ELL students with content instruction that is understandable to them, insomuch as their heritage language is used for instruction of content while developing the students' language skills in both English and the heritage language. For language majority students, these programs provide the opportunity to learn in a challenging environment that leads to high-academic achievement and the acquisition of a second language (Ovando & Combs, 2012; Rodriquez, et al., 2014). Just as long as these programs have existed, their effectiveness has been called into question (Conger, 2010; Valdes, 1997) or defended (Collier & Thomas, 2004, 2005; Cummins, 1992; Thomas & Collier, 1998, 2003b). Nonetheless, school districts continue to implement dual language programs as an educational approach that will prepare students for high-stakes testing, as well as for an increasingly diverse and global community.

The school in this study, Los Campos, implemented a dual language program in 2007. This study was the first time that the effectiveness of this two-way dual language program was analyzed. The study seeks to determine the effectiveness of the dual language program at Los Campos by answering the following question: Is there a statistically significant difference in the

achievement, both academically and linguistically, of the students at Los Campos as compared to like peers from their neighborhood schools?

The following subquestions provided the necessary information to answer the grand tour research question:

1. How do the students of Los Campos compare academically to like peers at their neighborhood schools as measured by the SSAT?
2. How do ELL students at Los Campos compare to like peers at their neighborhood schools as measured by the SSAT?
3. How do ELL students at Los Campos compare to like peers at their neighborhood schools in English acquisition as measured by the SELA?

This study is significant in that it is unique from many of the studies previously conducted. Thomas and Collier (1998, 2003; and as Collier & Thomas, 2004) along with other researchers, such as Lindholm-Leary (2011), Krashen (2004), and Genesee, Lindholm-Leary, Saunders, and Christian (2005), conducted large-scale studies that included multiple school districts over long periods of time. Many of these studies and others have been conducted in large urban school districts, which were located in communities where a language other than English is predominantly spoken. This study took place in a small rural and semiurban community where English is the dominant language.

Another unique feature of this study that adds to its significance is that it is a matched-pair comparison. This study, like many others, uses ex post facto, standardized test scores for comparison (Alanis, 2000; Cobb et al., 2006; Collier & Thomas, 2004; Conger, 2010; Genesee et al., 2005). However, previous studies provided data without providing a matched

comparison group (Krashen, 2004). This study closely matched participants to like peers for the purpose of comparing achievement on standardized testing.

Of additional significance is the type of program model that was analyzed. Much of the existing body of work focuses on 90:10 models or 50:50 models (Alanis, 2000; Alanis & Rodriguez, 2008; Christian et al., 2000; Cobb et al., 2006; Collier & Thomas, 2004; De Jesus, 2008; Krashen & McField, 2005; Thomas & Collier, 2003a). The program in this study is an 80:20 model in which early program instruction is given to students in Spanish 80% of the time and in English 20% of the time. As students progress through the school, the percentage of Spanish decreases by 10% and the percentage of English increases by 10% until a balance is reached at 50:50. This program model is unique, so much so that the researcher did not find one study specific to an 80:20 model.

This study also holds particular significance to the school district in which Los Campos is located. The district has made a significant commitment to the implementation of this dual language program at a significant cost. During the last two academic school years, the district experienced a severe financial crisis that caused the district to carefully evaluate what was considered essential and cost effective. The results of this study may have the potential of providing guidance for the district in future planning for Los Campos.

Chapter 5 sheds light on the results of this study. It summarizes the results, draws conclusions, makes recommendations for further research, and outlines implications for professional practice. It is the purpose of Chapter 5 to make the content of this study accessible and applicable.

Summary of Results

This study investigates the effectiveness of the two-way dual language program at Los Campos Dual Language Magnet School. This study uses quantitative research methods. Creswell (2014) explained that quantitative methods are used when examining the relationship between variables, which can be measured using statistical measures or instruments. The study uses ex post facto test data to determine how the students at Los Campos performed on the SSAT, as compared to like peers from their neighborhood schools. Students are compared in reading, language usage, math, and science. In addition, ELL students' achievement on the SSAT is compared to that of ELL students from their neighborhood schools. ELL students' language acquisition is also compared.

Participants in this study are students from Los Campos who had attended the school from kindergarten through fifth grade and students from neighborhood schools who had attended their school from kindergarten through fifth grade. The study seeks to build reliability and validity by only including those students who had received the same instruction or "treatment." Students who were on an individual education plan were excluded from the study because the instruction they received was unique to them.

To increase the validity of the results, it was required that the Los Campos student and the like peer both be assigned to the same neighborhood school. In addition, matched pairs were made by closely matching students in at least three of the following areas: gender, ethnicity, age, language dominance, ELL status upon enrollment into kindergarten, and initial reading score upon enrollment into kindergarten. The study intended to include socioeconomics and school factors as well in making matched pairs; however, this did not take place to the extent desired and is

discussed further in the limitations. Taking these factors into account resulted in 53 matched pairs. Seventeen of these pairs consisted of ELL students.

The data were analyzed using a matched-pair *t*-test. This two-tailed parametric test provides robust results. The variables for this test are considered dependent because they are closely matched.

Research subquestion 1. The first subquestion of this study addresses how the students of Los Campos compare academically to like peers from their neighborhood schools. The SPSS results for reading reveal that $p = .412$. The calculated p value is > .05, indicating that there is no statistically significant difference between the reading scores of Los Campos students and like peers from their neighborhood schools. The SPSS results for language usage reveal that $p = .468$. The calculated p value is > .05, indicating that there is no statistically significant difference between the language usage scores of the two groups. The SPSS results for math reveal that $p = .226$. The calculated p value is > .05, indicating that there is no statistical difference for the math achievement of students participating in two-way dual language instruction and like peers at neighborhood schools. The SPSS results for science show that $p = .236$. The calculated p value is > .05, indicating that there is no significant statistical difference between the two groups' science scores.

Research subquestion 2. The second subquestion addresses how ELL students at Los Campos compare academically to like peers at their neighborhood schools. The data for ELL students are a subset of the data for all participants. This subset has 17 matched pairs. The SPSS results for reading indicate that $p = .004$. The calculated p value is < .05, indicating that there exists a statistically significant difference in the

achievement of Los Campos ELL students in reading, as compared to like peers at their neighborhood schools. The SPSS results for language usage show that $p = .516$. The calculated p value is > .05, indicating that there is no statistically significant difference between the language usage scores of Los Campos ELL students, as compared to like peers from their neighborhood schools. The SPSS results for math indicate that $p = .176$. The calculated p value is > .05, indicating that there is no significant difference in the math achievement of Los Campos ELL students and like peers from their neighborhood schools. The SPSS results for science for ELL students indicate that $p = .276$. The calculated p value is > .05, showing that the difference in achievement for ELL students between the two groups is not statistically significant.

Research subquestion 3. The third subquestion seeks to determine how ELL students at Los Campos compare in English language acquisition to like peers at their neighborhood schools. To answer this question, the same 17 pairs from the previous question were analyzed again. This time they were compared only for English language acquisition by analyzing students' scores on the SELA. The results from SPSS show that $p = .206$. The calculated p value is > .05. The results show that there is no statistically significant difference in the language acquisition levels of Los Campos students, as compared to like peers from neighborhood schools. However, Los Campos students showed greater gains in English language acquisition, which combined with the results of the analysis of actual attained proficiency levels, trended towards significance.

Limitations. It is important to note that there are limitations that may have influenced the outcomes of this study. The location of the school in the study adds to the significance of the study, but also creates a limitation. The sample size is also a

limitation. There are 53 matched pairs in the study, but one school in the district did not provide the necessary information to participate in the study. Had they done so, there would have been the possibility of increasing the sample size by eight more pairs. Another limitation to the study is the lack of data to determine the levels of Spanish language acquisition for the majority language students. The Family Education Rights and Privacy Act limited access to individual data on free and reduced lunch. This information was intended to be used as a means to increase the reliability and validity of the outcomes by accounting for the effects of poverty on teaching and learning as outlined by Payne (2005). An additional limitation is the availability of data about school factors. The researcher intends to use data in regards to teacher experience, teacher education levels, and curriculum to narrow the possible variables impacting the outcomes of the statistical analysis. However, the district in this study was unable to provide this information.

Conclusions

The research question that guided this study sought to analyze if there was a significant difference in the achievement, both academically and linguistically, of the students at Los Campos as compared to like peers from their neighborhood schools. The statistical analysis conducted to answer the three subquestions provided an answer to the research question. Simply put, there was no significant difference in the academic and linguistic achievement of the Los Campos students when compared to like peers from their neighborhood schools, with the exception of reading achievement for ELL students. In this area, Los Campos students scored lower than did their like peers.

As a whole group, Los Campos students scored equally as well in reading, language usage, math, and science as did their like peers. These results fall in line with the findings of Collier and Thomas (2004, 2005, 2009), Krashen (2004), Lindholm-Leary and Hernandez (2011), and Christian et al. (2000). Los Campos students received content instruction in Spanish for 65% of their elementary education. This yields the same results as if they had received all of their instruction in English. Dual language instruction had no negative effects for Los Campos students as a whole.

In fact, not only did Los Campos students achieve the same levels of academic success as did their peers who attended non-dual language neighborhood schools, but Los Campos students were provided with the opportunity to become bilingual and biliterate. One of the limitations of the study was an inability to analyze the levels of bilingualism for all Los Campos students. However, research by Collier and Thomas (2003b), Lindholm-Leary (2004), and Dixon et al. (2012) indicated that participation in dual language instruction leads to high levels of bilingualism for all students. The results of the data analysis on SELA scores showed that Los Campos students entered kindergarten with lower levels of English language acquisition than their like peers, and while not statistically significant, they exited fifth grade with higher levels of English language acquisition than their like peers. Participation in a two-way dual language program yielded greater gains in English language acquisition that were near statistical significance for Los Campos students when compared to a like peer from their neighborhood school. Collier and Thomas (2003b), Lindholm-Leary (2004), and Dixon et al. (2012) pinpointed factors, such as a program that lasts a minimum of six years, using the new language in formal and informal settings, and fidelity to the language of instruction as essential in

developing bilingualism. These factors were all in place at Los Campos, so it stands to reason that Los Campos students attain high levels of bilingualism as well.

Similar to the studies conducted by Collier and Thomas (2004, 2009), and Lindholm-Leary and Hernandez (2011), the results of this study showed that ELL students at Los Campos have the same levels of academic achievement in language usage, math, and science as do their like peers from their neighborhood schools. All of the students in this subset began kindergarten as dominant Spanish speakers. These students received 65% of their instruction in their heritage language and were still able to meet the same academic levels in language usage, math, and science as their peers. It is important to note that all state assessments in these areas were conducted in English. The ELL students at Los Campos also have the opportunity to develop linguistically in ways that their peers at their neighborhood schools do not. The analysis of ELL participants of this study showed that Los Campos students have the same level of English language acquisition as do their peers at their neighborhood schools. These results support the findings of De Jesus (2008), Lindholm-Leary (2005), Murphy (2010), and Quintanar-Sarellana (2004). Los Campos students not only learn English as well as their peers in non-dual language schools, but they are also provided with the opportunity to maintain and develop their heritage language.

The results for ELL reading indicate that Los Campos students did not attain the same level of achievement as their like peers at their neighborhood schools. However, research by Collier and Thomas (2009) and Thomas and Collier (2003a) indicated that students may initially lag behind academically, but tend to catch up beginning in fifth grade and through the middle school years. Their studies also showed that the benefits of participation in a dual language program extend well beyond the end of the program itself. It is quite possible that the Los

Campos students in this study will continue to grow throughout middle school and eventually meet or exceed the reading levels of their like peers.

In addition to meeting all of the same academic achievement levels, save one, as their peers, the students at Los Campos also receive the benefits of becoming bilingual. While the results of the data analysis showed that there was no statistical difference in the academic and linguistic achievement of Los Campos students when compared to a like peer from their neighborhood schools, participation in a two-way dual language program did add value to their education that students in the neighborhood schools did not gain. Los Campos students not only reached a level of bilingualism, but also reaped the benefits of having learned a second language, as well as having learned in a second language. Research by Zelasko and Antunez (2000) and Hernandez (2013) showed that the brains of bilingual individuals are more active and flexible. They suggested that bilinguals are more capable of understanding math concepts and find problem solving easier. They also explained that bilinguals have more facility in focusing, remembering, and making decisions. These findings were supported by Thomas and Collier (2003b), who suggested that bilinguals are more analytical in their thinking. Leikin (2012) and Thomas and Collier (2003b) posited that bilinguals are more creative. Furthermore, individuals who are bilingual are better prepared to participate in a global community and are more willing to learn about people from other cultures. They tend to be more connected to home, culture, and community, and have a better sense of identity (Thomas & Collier, 2003b; Zelasko & Antunez, 2000).

In drawing conclusions about this study, a key component is the theoretical framework upon which the two-way dual language instruction at Los Campos was founded. Based on the results of the study, it would appear that the framework is sound. The theoretical framework

hypothesizes that providing both language minority and language majority students with strong heritage language literacy instruction (Thomas & Collier, 2003b), comprehensible instruction (Krashen, 1992), and developing both basic interpersonal communication skills and cognitive academic language proficiency (Cummins, 2000) will lead to academic achievement and to second-language acquisition. Based on the results of this study, the assumptions made in the theoretical framework are substantiated.

Recommendations for Further Research

As the world of education continues to evolve and grow, it is important to continue to study dual language education. While this study focuses on ex post facto, state testing data, and the effectiveness of a two-way dual language program, it has brought to light many areas for future research.

Areas for further research specific to Los Campos.

1. What key factors led to the success of Los Campos' two-way dual language program beyond those identified in the theoretical framework? To what degree did the factors listed in the literature review exist at Los Campos?
2. What led to lower reading scores for Los Campos' ELL students as compared to like peers at their neighborhood schools? What changes need to be made to the two-way dual language program at Los Campos to improve the reading skills of ELL students?
3. What are students' and parents' perceptions of the two-way dual language program at Los Campos?
4. Will the results illustrated in this study be sustained over time? Will students who participated in the two-way dual language program continue to grow and outperform their peers as research suggests (Collier & Thomas, 2003b), or will they plateau?

Areas for further research for dual language instruction in general.

1. To what extent are the majority language speakers becoming fluent in the minority language? What levels of literacy in the minority language do they attain?
2. What impact does a two-way dual language program have on students' interpersonal relationships with members of a cultural group that is not their own? What impact, if any, does it have on the community?
3. Is there any difference in the levels of heritage language development between minority language speakers who participate in a two-way dual language program and those who participate in a general education program?
4. Does participation in a two-way dual language program influence students' decisions to continue formal instruction in the minority language in high school and higher education?
5. How does participation in a two-way dual language program impact instruction within the Common Core? How does the Common Core impact two-way dual language instruction?

Implications for Professional Practice

While there is a significant amount of research on dual language instruction, the results of this study will be helpful to better understand how participants in a dual language program achieve academically and linguistically in comparison to like peers. This study brings to the forefront implications for professional practice.

First, implementation and participation in a two-way dual language program have no ill effects for language minority and language majority students. In fact, with one exception that requires further research, students who participate in a two-way dual language program achieve

at the same level as like peers, but also receive the benefits of becoming bilingual. When districts, schools, and parents make choices about how to provide students with the best educational program that will lead to high-academic achievement and prepare students for an increasingly diverse and global community, a two-way dual language program should be part of the discussion.

Second, teaching ELL students in their heritage language does not impede the acquisition of English. In fact, using students' heritage language helps build content knowledge that can be transferred from one language to another. Teaching in the students' heritage language helps students to bridge the learning gap. As districts, schools, and parents consider the best practices for teaching ELL students English, while providing them with an academic program that will lead to achievement, two-way dual language instruction should be considered as an effective approach.

Last, this study demonstrates that teaching all content areas, with the exception of English language arts, primarily in the minority language in kindergarten through second grade, and then using English to teach content areas that appear on state testing for grades 3–5 support students in building content knowledge and vocabulary competency that will lead to academic achievement. While several program models exist, it is critical that districts and schools carefully consider the uniqueness of their community and students and then plan a program tailored to meet their needs.

Epilogue

Researcher Reflections on the Study

This study took the researcher on a personal journey of discovery—both academically and personally. This study has led to professional and personal growth that would not have been attained otherwise. Academically, the study revealed the complexities of a doctoral dissertation. As the researcher reflects on the academic journey, hindsight has informed her of several "wrong turns" that should not have been taken and that can serve as "signposts" for researchers interested in replication or adaptation of this study. The wrong turns were:

- The study would have benefited from an analysis of students' acquisition and development of the Spanish language. Unfortunately, when Los Campos first came into existence, the founders did not consider the valuable information that could be gathered by testing for initial Spanish language skills. In subsequent years, some efforts were made to assess majority language students' acquisition of Spanish and heritage Spanish speakers' continued development of Spanish. However, these efforts were inconsistent. As the data analysis shows time and time again that the students of Los Campos have reached the same levels of academic achievement as their peers at their neighborhood schools, it becomes very evident that what truly sets the Los Campos students apart is their ability to read, write, communicate, and learn in Spanish. Regrettably, there are no reliable data available to quantify students' abilities.
- The study would have benefited from a better understanding of federal privacy laws. In an attempt to account for as many student demographic variables as possible, an inordinate amount of time and effort was spent on trying to obtain free and reduced

lunch data. This effort compounded what was already a stressful proposition—data collection and analysis, and dissertation writing. A little research into what variables could reasonably be accounted for would have saved countless e-mails and meetings with district administration, a denial e-mail from the state, and high levels of frustration.

- The study would have benefited from an analysis of ex post facto test data for the same group of participants at grades 3 and 4. This would have been most helpful in understanding ELL students' achievement in reading. It would have provided a picture that included more than one snapshot in time. The data analysis shows that there exists a statistically significant difference in the level of achievement in reading between Los Campos ELL students and like peers from their neighborhood schools. Had data from the SSAT at grades 3 and 4 been available, it would have been able to reveal a trend line. This data may have been able to show if ELL students' achievement was increasing each year, if it was flat lined, or if it was on a decline. Without this data, the researcher is left with multiple questions. First and foremost, what steps do the Los Campos teaching staff need to take to ensure that the ELL students of Los Campos are provided with the necessary instruction that will lead to the same levels of achievement or higher levels of achievement in reading than their like peers at their neighborhood schools?

The researcher's personal journey was in great part directed by the use of vignettes at the beginning of each chapter. The vignettes created a personal connection beyond what had been imagined. Due to a personal connection with Los Campos, the researcher was extremely careful to keep a safe distance, so to speak, between her and the work. Intent on being as objective as

possible, the process had become all about the numbers and not so much about the students. The vignettes kept the researcher connected to her heritage, which was what first brought her to the field of bilingual education and helped her make connections between the research and her own school and its students, which have kept her deeply engaged in the field.

The personal journey also taught the researcher that persistence was her "best friend" and that she had the fortitude to withstand much more than had ever been imagined, and more importantly, the researcher had the discernment necessary to lead others through taxing trials. While this dissertation was a challenge for the researcher, it was not the greatest challenged confronted during the past two years. Unfortunately, her school has faced two extremely difficult years. Its district was confronted with a severe financial shortfall. As a result, cost-cutting measures were taken that directly affected the school. These measures led to the departure of seven talented educators and one third of the school's student body. Tragically, the school also suffered through the passing of two family members: The husband of one of the teachers passed away suddenly and unexpectedly, and one of the teachers who had been at the school since the day it opened was diagnosed with a terminal illness and passed away in a very short period of time.

In many ways, this study served as an anchor through the mist of the hardships. It was constant, always there waiting to be tackled when time allowed. It served as a beacon of inspiration for the staff, who knew that, in spite of all that was going on at school, the researcher was still persistent in studying the work in which they, too, were so deeply engaged. It provided hope to parents that the district would remain committed to their school as the outcomes of the data analysis were shared with them.

In the end, the journey was a capstone in the researcher's life that has sharpened her professional and personal focus in terms of bilingual and biliterate education. Her focus has been transferred to the students, families, and educators engaged in the work of dual language instruction in terms of providing a clear and defined picture of the quality education that students are receiving, which has led to high-academic achievement, second-language acquisition, and increased opportunities now and in the future. Realizing that the study has made a difference in the researcher's praxis and the education of the students is, without doubt, the most important outcome of this doctoral research.

Alignment with the University's Instructional Values

Finally, the study aligned with Northwest Nazarene University's four institutional values—transformation, truth, community, and service (Doctoral Dissertation Handbook, p. 5).

The study was transformative for the researcher both in intellectual and spiritual development in terms of understanding the requirements and standards of academic research and in terms of drawing upon spiritual beliefs in by of seeking guidance from my Savior and advocate with the Father, Jesus Christ. The study had a transformative impact on Los Campos as well in that the research brought into focus for the school's principal the school's academic achievements and needs for improvement. *A Dios rogando y con mazo dando.* This means that one can plead with God for help, guidance, or transformation, but one must also do the necessary work.

By exploring the factual components of the school's educational purpose, this study advanced the truth about dual language programs and aligned with Northwest Nazarene's second core value—that education pursues the truth. *Desde lejos se lo parecen, de cerca ni duda merecen.* From a distance something may appear to be true, but upon closer review, one

will have no doubt. At a glance, the instruction program at Nueve Vista appeared to be benefiting students. This study has demonstrated that it is not only an appearance, but a truth.

The study revealed the importance of education and community, the University's third core value. The school district, community, parents, and faculty invested in a specific educational practice—dual language instruction—in the form of a magnet school, a challenging intellectual and, in many respects value laden decision. *Si quiere conocer a Andrés, vive con él un mes.* This adage means that if one wants to truly understand a person, or in the case of this study, a community and a school, one must spend time within the school or community to truly gain knowledge towards an informed understanding. The study's conclusions have helped inform the stakeholders about the investment and decisions regarding future of Los Campos and possibly other similar schools.

The Los Campos school project required a strong service commitment from all stakeholders, reflecting the University's fourth core value, service or leadership by giving of ourselves to others. Without servanthood, the school's very existence would be jeopardized. The spirit of servanthood, though unspoken, was a factor in creating and maintaining Los Campos and alignment to this core value remains the focus of the researcher. *Hoy por ti, mañana por mí.* This adage means that the person who is being helped today may be you, but tomorrow it may be me. In the case of this study and in her daily role as principal, the researcher intended to provide service for others, but in the end, it was also the researcher who has reaped a great reward.

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Appendix A

Matched-Pair Criteria Data

Pair Code	DOB	Gender	Ethnicity	Neighborhood School	IRI	IELA Level
01 LC	August-02	M	Caucasian	A Elementary	2	
01 AE	June-02	M	Caucasian	A Elementary	2	
02 LC	March-02	F	Hispanic-Latino	A Elementary	1	
02 AE	February-02	F	Hispanic-Latino	A Elementary	1	
03 LC	January-02	F	Caucasian	A Elementary	3	
03 AE	December-01	F	Caucasian	A Elementary	3	
04 LC	March-02	M	Caucasian	A Elementary	3	
04 AE	December-01	M	Caucasian	A Elementary	3	
05 LC	January-02	F	Hispanic-Latino	A Elementary	2	4
05 AE	October-01	F	Hispanic-Latino	A Elementary	1	4
06 LC	March-02	M	Hispanic-Latino	A Elementary	2	
06 AE	August-02	M	Hispanic-Latino	A Elementary	1	
07 LC	December-01	M	Hispanic-Latino	B Elementary	1	4
07 BE	December-01	M	Hispanic-Latino	B Elementary	1	5
08 LC	May-02	F	Hispanic-Latino	B Elementary	1	
08 BE	March-02	F	Hispanic-Latino	B Elementary	1	
09 LC	December-01	F	Hispanic-Latino	B Elementary	2	
09 BE	September-01	F	Hispanic-Latino	B Elementary	2	
10 LC	November-01	F	Hispanic-Latino	C Elementary	1	3
10 CE	October-01	F	Hispanic-Latino	C Elementary	2	5
11 LC	November-01	M	Caucasian	C Elementary	3	
11 CE	September-01	M	Caucasian	C Elementary	3	
12 LC	April-02	F	Hispanic-Latino	C Elementary	1	3
12 CE	January-02	F	Hispanic-Latino	C Elementary	2	5
13 LC	January-02	M	Hispanic-Latino	C Elementary	2	4
13 CE	January-02	M	Hispanic-Latino	C Elementary	1	4
14 LC	August-02	M	Hispanic-Latino	C Elementary	1	
14 CE	August-02	M	Hispanic-Latino	C Elementary	1	
15 LC	August-02	F	Hispanic-Latino	C Elementary	1	4
15 CE	June-02	F	Hispanic-Latino	C Elementary	1	3
16 LC	May-02	F	Caucasian	D Elementary	3	
16 DE	May-02	F	Caucasian	D Elementary	3	
17 LC	January-02	F	Hispanic-Latino	D Elementary	3	4
17 DE	December-01	F	Hispanic-Latino	D Elementary	3	4
18 LC	July-02	M	Hispanic-Latino	D Elementary	1	3
18 DE	February-02	M	Hispanic-Latino	D Elementary	2	4
19 LC	January-02	M	Caucasian	E Elementary	3	
19 EE	April-02	M	Caucasian	E Elementary	3	
20 LC	May-02	M	Hispanic-Latino	E Elementary	3	2
20 EE	February-02	M	Hispanic-Latino	E Elementary	2	2
21 LC	October-01	M	Caucasian	E Elementary	3	
21 EE	July-01	M	Caucasian	E Elementary	3	
22 LC	June-02	F	Caucasian	E Elementary	3	
22 EE	August-02	F	Caucasian	E Elementary	3	

23 LC	July-02	F	Caucasian	E Elementary	2	
23 EE	August-02	F	Caucasian	E Elementary	2	
24 LC	May-02	F	Hispanic-Latino	E Elementary	1	2
24 EE	August-02	F	Hispanic-Latino	E Elementary	1	2
25 LC	January-02	F	Hispanic-Latino	F Elementary	3	
25 FE	March-02	F	Hispanic-Latino	F Elementary	3	
26 LC	Mar-02	F	Hispanic-Latino	F Elementary	2	
26 FE	May-02	F	Hispanic-Latino	F Elementary	3	
27 LC	October-01	M	Caucasian	F Elementary	3	
27 FE	October-01	M	Caucasian	F Elementary	3	
28 LC	October-01	F	Caucasian	F Elementary	3	
28 FE	December-01	F	Caucasian	F Elementary	3	
29 LC	March-02	F	Caucasian	F Elementary	3	
29 FE	June-02	F	Caucasian	F Elementary	3	
30 LC	March-02	F	Caucasian	F Elementary	3	
30 FE	May-02	F	Caucasian	F Elementary	3	
31 LC	Apirl-02	M	Caucasian	F Elementary	3	
31 FE	July-02	M	Caucasian	F Elementary	3	
32 LC	March-02	M	Caucasian	F Elementary	3	
32 FE	February-02	M	Caucasian	F Elementary	3	
33 LC	July-02	F	Hispanic-Latino	G Elementary	3	4
33 GE	April-02	F	Hispanic-Latino	G Elementary	2	3
34 LC	May-02	M	Caucasian	G Elementary	3	
34 GE	April-02	M	Caucasian	G Elementary	3	
35 LC	February-02	M	Caucasian	G Elementary	3	
35 GE	December-01	M	Caucasian	G Elementary	3	
36 LC	December-02	F	Caucasian	G Elementary	3	
36 GE	March-02	F	Caucasian	G Elementary	3	
37 LC	September-01	M	Hispanic-Latino	H Elementary	3	4
37 HE	January-02	M	Hispanic-Latino	H Elementary	1	4
38 LC	September-01	F	Caucasian	H Elementary	3	
38 HE	November-01	F	Caucasian	H Elementary	3	
39 LC	February-02	F	Hispanic-Latino	I Elementary	3	
39 IE	August-02	F	Hispanic-Latino	I Elementary	2	
40 LC	November-01	M	Caucasian	I Elementary	2	
40 IE	September-01	M	Caucasian	I Elementary	2	
41 LC	August-02	F	Caucasian	I Elementary	3	
41 IE	May-02	F	Caucasian	I Elementary	3	
42 LC	Apirl-02	M	Caucasian	I Elementary	3	
42 IE	April-02	M	Caucasian	I Elementary	3	
43 LC	October-01	M	Caucasian	I Elementary	3	
43 IE	December-01	M	Caucasian	I Elementary	3	
44 LC	October-01	F	African American	I Elementary	3	
44 IE	August-02	F	African American	I Elementary	3	
45 LC	December-01	M	Caucasian	J Elementary	3	
45 JE	March-02	M	Caucasian	J Elementary	3	
46 LC	Nov-01	F	Caucasian	J Elementary	3	
46 JE	January-02	F	Caucasian	J Elementary	3	

47 LC	Apirl-02	F	Hispanic-Latino	J Elementary	2	3
47 JE	August-02	F	Hispanic-Latino	J Elementary	2	4
48 LC	May-02	F	Caucasian	K Elementary	1	
48 KE	February-02	F	Caucasian	K Elementary	1	
49 LC	February-02	F	Hispanic-Latino	K Elementary	1	2
49 KE	December-01	F	Hispanic-Latino	K Elementary	2	3
50 LC	July-01	M	Hispanic-Latino	K Elementary	1	4
50 KE	December-01	M	Hispanic-Latino	K Elementary	2	4
51 LC	November-01	F	Hispanic-Latino	L Elementary	2	5
51 LE	January-02	F	Hispanic-Latino	L Elementary	3	5
52 LC	September-01	F	Hispanic-Latino	L Elementary	3	
52 LE	September-01	F	Hispanic-Latino	L Elementary	3	
53 LC	June-02	F	Hispanic-Latino	L Elementary	2	4
53 LE	July-02	F	Hispanic-Latino	L Elementary	1	3

Appendix B

Matched-Pair Test Data

Pair Code	Reading	Language	Mathematics	Science
01 LC	225	223	230	222
01 AE	198	209	207	202
02 LC	230	223	214	222
02 AE	210	221	224	212
03 LC	203	219	217	216
03 AE	230	227	238	220
04 LC	219	230	230	222
04 AE	208	212	204	201
05 LC	199	209	204	199
05 AE	218	216	214	222
06 LC	207	200	203	201
06 AE	207	211	216	209
07 LC	206	211	209	202
07 BE	215	210	207	209
08 LC	214	212	204	208
08 BE	225	221	226	218
09 LC	204	211	202	206
09 BE	207	207	209	203
10 LC	215	227	243	215
10 CE	206	214	212	202
11 VN	218	225	214	215
11 CE	195	207	214	203
12 LC	205	201	202	201
12 CE	238	227	226	208
13 LC	200	207	204	201
13 CE	221	219	217	240
14 LC	209	207	199	201
14 CE	209	202	203	205
15 LC	203	210	214	197
15 CE	219	215	208	209
16 LC	257	238	238	220
16 DE	233	223	230	215
17 LC	214	218	204	212
17 DE	206	201	224	201
18 LC	200	215	214	207
18 DE	205	205	211	198
19 LC	219	218	221	225
19 EE	217	219	214	213
20 LC	207	200	196	201
20 EE	210	202	208	202
21 LC	245	238	238	240
21 EE	217	218	222	212
22 LC	219	221	222	222
22 EE	233	233	243	228

23 LC	238	233	243	225
23 EE	225	230	243	215
24 LC	212	204	203	212
24 EE	230	219	217	206
25 LC	238	233	224	225
25 FE	213	218	218	207
26 LC	206	221	212	203
26 FE	230	227	227	212
27 LC	227	233	222	216
27 FE	215	219	230	225
28 LC	209	211	205	203
28 FE	221	223	243	209
29 LC	227	238	238	233
29 FE	223	225	243	213
30 LC	212	225	230	212
30 FE	223	223	226	209
31 LC	227	238	263	233
31 FE	230	233	232	240
32 LC	215	219	210	210
32 FE	223	230	227	216
33 LC	208	214	210	212
33 GE	217	216	211	209
34 LC	217	214	211	212
34 GE	223	218	214	216
35 LC	230	238	243	240
35 GE	230	238	227	210
36 LC	209	218	212	213
36 GE	233	216	219	213
37 LC	203	208	213	205
37 HE	213	211	212	210
38 LC	213	201	202	196
38 HE	219	216	213	218
39 LC	223	227	238	225
39 IE	238	223	218	225
40 LC	218	216	218	220
40 IE	214	230	214	208
41 LC	203	207	216	213
41 IE	208	216	219	203
42 LC	209	218	209	212
42 IE	210	219	218	210
43 LC	227	223	218	240
43 IE	221	218	218	228
44 LC	219	225	217	209
44 IE	219	218	238	222
45 LC	225	221	226	228
45 JE	227	221	232	210
46 LC	223	233	221	220
46 JE	204	211	200	192

47 LC	198	209	203	200
47 JE	204	191	191	194
48 LC	227	227	219	222
48 KE	221	227	216	212
49 LC	205	208	203	200
49 KE	205	207	209	207
50 LC	208	200	198	205
50 KE	214	211	216	207
51 LC	223	238	224	218
51 LE	230	233	238	225
52 LC	238	233	222	212
52 LE	230	215	218	212
53 LC	217	203	212	208
53 LE	217	218	214	206

Appendix C

SELA Scores by Matched Pairs

Pair #	Initial Score	End Score		Pair #	Initial Score	End Score
05LC	4	5		20LC	2	4
05AE	4	4		20EE	2	4
07LC	4	4		24LC	2	4
07BE	5	1		24EE	2	4
10LC	3	5		33LC	4	4
10CE	5	4		33GE	3	5
12LC	3	5		37LC	4	5
12CE	5	5		37HE	4	5
13LC	4	3		47LC	3	5
13CE	4	5		47JE	4	5
15LC	4	4		49LC	2	5
15CE	3	4		49KE	3	4
17LC	4	5		51LC	5	5
17DE	4	5		51LE	5	5
18LC	3	5		53LC	4	5
18DE	4	4		53LE	3	4

Appendix D

T Table

α (one tail)	0.05	0.025	0.01	0.005	0.0025	0.001	0.0005
α (two tail)	0.1	0.05	0.02	0.01	0.005	0.002	0.001
df							
1	6.3138	12.7065	31.8193	63.6551	127.3447	318.4930	636.0450
2	2.9200	4.3026	6.9646	9.9247	14.0887	22.3276	31.5989
3	2.3534	3.1824	4.5407	5.8408	7.4534	10.2145	12.9242
4	2.1319	2.7764	3.7470	4.6041	5.5976	7.1732	8.6103
5	2.0150	2.5706	3.3650	4.0322	4.7734	5.8934	6.8688
6	1.9432	2.4469	3.1426	3.7074	4.3168	5.2076	5.9589
7	1.8946	2.3646	2.9980	3.4995	4.0294	4.7852	5.4079
8	1.8595	2.3060	2.8965	3.3554	3.8325	4.5008	5.0414
9	1.8331	2.2621	2.8214	3.2498	3.6896	4.2969	4.7809
10	1.8124	2.2282	2.7638	3.1693	3.5814	4.1437	4.5869
11	1.7959	2.2010	2.7181	3.1058	3.4966	4.0247	4.4369
12	1.7823	2.1788	2.6810	3.0545	3.4284	3.9296	4.3178
13	1.7709	2.1604	2.6503	3.0123	3.3725	3.8520	4.2208
14	1.7613	2.1448	2.6245	2.9768	3.3257	3.7874	4.1404
15	1.7530	2.1314	2.6025	2.9467	3.2860	3.7328	4.0728
16	1.7459	2.1199	2.5835	2.9208	3.2520	3.6861	4.0150
17	1.7396	2.1098	2.5669	2.8983	3.2224	3.6458	3.9651
18	1.7341	2.1009	2.5524	2.8784	3.1966	3.6105	3.9216
19	1.7291	2.0930	2.5395	2.8609	3.1737	3.5794	3.8834
20	1.7247	2.0860	2.5280	2.8454	3.1534	3.5518	3.8495
21	1.7207	2.0796	2.5176	2.8314	3.1352	3.5272	3.8193
22	1.7172	2.0739	2.5083	2.8188	3.1188	3.5050	3.7921
23	1.7139	2.0686	2.4998	2.8073	3.1040	3.4850	3.7676
24	1.7109	2.0639	2.4922	2.7970	3.0905	3.4668	3.7454
25	1.7081	2.0596	2.4851	2.7874	3.0782	3.4502	3.7251
26	1.7056	2.0555	2.4786	2.7787	3.0669	3.4350	3.7067

27	1.7033	2.0518	2.4727	2.7707	3.0565	3.4211	3.6896
28	1.7011	2.0484	2.4671	2.7633	3.0469	3.4082	3.6739
29	1.6991	2.0452	2.4620	2.7564	3.0380	3.3962	3.6594
30	1.6973	2.0423	2.4572	2.7500	3.0298	3.3852	3.6459
31	1.6955	2.0395	2.4528	2.7440	3.0221	3.3749	3.6334
32	1.6939	2.0369	2.4487	2.7385	3.0150	3.3653	3.6218
33	1.6924	2.0345	2.4448	2.7333	3.0082	3.3563	3.6109
34	1.6909	2.0322	2.4411	2.7284	3.0019	3.3479	3.6008
35	1.6896	2.0301	2.4377	2.7238	2.9961	3.3400	3.5912
36	1.6883	2.0281	2.4345	2.7195	2.9905	3.3326	3.5822
37	1.6871	2.0262	2.4315	2.7154	2.9853	3.3256	3.5737
38	1.6859	2.0244	2.4286	2.7115	2.9803	3.3190	3.5657
39	1.6849	2.0227	2.4258	2.7079	2.9756	3.3128	3.5581
40	1.6839	2.0211	2.4233	2.7045	2.9712	3.3069	3.5510
41	1.6829	2.0196	2.4208	2.7012	2.9670	3.3013	3.5442
42	1.6820	2.0181	2.4185	2.6981	2.9630	3.2959	3.5378
43	1.6811	2.0167	2.4162	2.6951	2.9591	3.2909	3.5316
44	1.6802	2.0154	2.4142	2.6923	2.9555	3.2861	3.5258
45	1.6794	2.0141	2.4121	2.6896	2.9521	3.2815	3.5202
46	1.6787	2.0129	2.4102	2.6870	2.9488	3.2771	3.5149
47	1.6779	2.0117	2.4083	2.6846	2.9456	3.2729	3.5099
48	1.6772	2.0106	2.4066	2.6822	2.9426	3.2689	3.5051
49	1.6766	2.0096	2.4049	2.6800	2.9397	3.2651	3.5004
50	1.6759	2.0086	2.4033	2.6778	2.9370	3.2614	3.4960
51	1.6753	2.0076	2.4017	2.6757	2.9343	3.2579	3.4917
52	1.6747	2.0066	2.4002	2.6737	2.9318	3.2545	3.4877
53	1.6741	2.0057	2.3988	2.6718	2.9293	3.2513	3.4838
54	1.6736	2.0049	2.3974	2.6700	2.9270	3.2482	3.4800
55	1.6730	2.0041	2.3961	2.6682	2.9247	3.2451	3.4764
56	1.6725	2.0032	2.3948	2.6665	2.9225	3.2423	3.4730
57	1.6720	2.0025	2.3936	2.6649	2.9204	3.2394	3.4696
58	1.6715	2.0017	2.3924	2.6633	2.9184	3.2368	3.4663

59	1.6711	2.0010	2.3912	2.6618	2.9164	3.2342	3.4632
60	1.6706	2.0003	2.3901	2.6603	2.9146	3.2317	3.4602
61	1.6702	1.9996	2.3890	2.6589	2.9127	3.2293	3.4573
62	1.6698	1.9990	2.3880	2.6575	2.9110	3.2269	3.4545
63	1.6694	1.9983	2.3870	2.6561	2.9092	3.2247	3.4518
64	1.6690	1.9977	2.3860	2.6549	2.9076	3.2225	3.4491
65	1.6686	1.9971	2.3851	2.6536	2.9060	3.2204	3.4466
66	1.6683	1.9966	2.3842	2.6524	2.9045	3.2184	3.4441
67	1.6679	1.9960	2.3833	2.6512	2.9030	3.2164	3.4417
68	1.6676	1.9955	2.3824	2.6501	2.9015	3.2144	3.4395
69	1.6673	1.9950	2.3816	2.6490	2.9001	3.2126	3.4372
70	1.6669	1.9944	2.3808	2.6479	2.8987	3.2108	3.4350
71	1.6666	1.9939	2.3800	2.6468	2.8974	3.2090	3.4329
72	1.6663	1.9935	2.3793	2.6459	2.8961	3.2073	3.4308
73	1.6660	1.9930	2.3785	2.6449	2.8948	3.2056	3.4288
74	1.6657	1.9925	2.3778	2.6439	2.8936	3.2040	3.4269
75	1.6654	1.9921	2.3771	2.6430	2.8925	3.2025	3.4250
76	1.6652	1.9917	2.3764	2.6421	2.8913	3.2010	3.4232
77	1.6649	1.9913	2.3758	2.6412	2.8902	3.1995	3.4214
78	1.6646	1.9909	2.3751	2.6404	2.8891	3.1980	3.4197
79	1.6644	1.9904	2.3745	2.6395	2.8880	3.1966	3.4180
80	1.6641	1.9901	2.3739	2.6387	2.8870	3.1953	3.4164
81	1.6639	1.9897	2.3733	2.6379	2.8859	3.1939	3.4147
82	1.6636	1.9893	2.3727	2.6371	2.8850	3.1926	3.4132
83	1.6634	1.9889	2.3721	2.6364	2.8840	3.1913	3.4117
84	1.6632	1.9886	2.3716	2.6356	2.8831	3.1901	3.4101
85	1.6630	1.9883	2.3710	2.6349	2.8821	3.1889	3.4087
86	1.6628	1.9879	2.3705	2.6342	2.8813	3.1877	3.4073
87	1.6626	1.9876	2.3700	2.6335	2.8804	3.1866	3.4059
88	1.6623	1.9873	2.3695	2.6328	2.8795	3.1854	3.4046
89	1.6622	1.9870	2.3690	2.6322	2.8787	3.1844	3.4032
90	1.6620	1.9867	2.3685	2.6316	2.8779	3.1833	3.4020

91	1.6618	1.9864	2.3680	2.6309	2.8771	3.1822	3.4006
92	1.6616	1.9861	2.3676	2.6303	2.8763	3.1812	3.3995
93	1.6614	1.9858	2.3671	2.6297	2.8755	3.1802	3.3982
94	1.6612	1.9855	2.3667	2.6292	2.8748	3.1792	3.3970
95	1.6610	1.9852	2.3662	2.6286	2.8741	3.1782	3.3959
96	1.6609	1.9850	2.3658	2.6280	2.8734	3.1773	3.3947
97	1.6607	1.9847	2.3654	2.6275	2.8727	3.1764	3.3936
98	1.6606	1.9845	2.3650	2.6269	2.8720	3.1755	3.3926
99	1.6604	1.9842	2.3646	2.6264	2.8713	3.1746	3.3915
100	1.6602	1.9840	2.3642	2.6259	2.8706	3.1738	3.3905

Appendix E

Request to Conduct Study

April 15, 2013

Dear Dr. [redacted],

I am currently working towards obtaining a doctorate degree in education from Northwest Nazarene University. It is my hope that I will be able to conduct a study within the district for the purpose of meeting the dissertation requirement of the doctoral program.

For my study, I would like to do a matched pair comparison between [redacted] students and students throughout the district. The purpose of my study is to evaluate the academic and linguistic effectiveness of the dual language program. While my study will answer several research questions, the primary question is whether or not the students at [redacted] have reached the same levels of academic and linguistic achievement as other students in the district.

To complete my study, [redacted] 5th grade students will be matched with a like-peer at their home-school and a comparison of the students' academic and linguistic achievement will be conducted. My study will not require direct contact with students. My proposed study is purely quantitative in nature and will require access to students' IRI, ISAT and IELA scores. I would also need access to students' demographic information including: gender, age, socio-economic status (as determined by free and reduced lunch), ethnicity and language dominance. In addition, I will need information about each school-site, such as the number of years teachers have been in the field, the number of teachers with a Master's Degree, and the curriculum materials used for instruction.

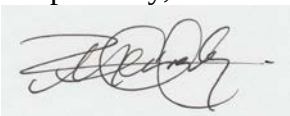
I can assure you that students' identities and that of each school-site will be protected throughout the study, and the highest levels of confidentiality and security will be observed at all times. I have already devised a system for maintaining the anonymity of both the students and the school sites. Research data will be accessed only by me and will be stored in a locked cabinet.

I respectfully ask for your permission, as the district superintendent, to conduct my proposed study within the [redacted] School District from July 1, 2013 through April 30, 2014. While I will not begin my work until the Human Research and Review Committee (HRRC) at NUU has approved my study, it is critical to collect preliminary information about 5th grade students, namely which 5th grade students have attended each elementary school from kindergarten through 5th grade, prior to students' cumulative files being distributed to the middle schools. Therefore, your timely response would greatly be appreciated. Please be aware that in order to

protect this information until I have been approved to begin my study, schools will be asked to send it to [redacted] the testing coordinator for this district.

Thank you for your consideration.

Respectfully,



Valerie Fuhriman-Cleverly

Appendix F

District Approval of Study

[redacted]

April 19, 2013

Northwest Nazarene University
Attention: HRRC Committee
Helstrom Business Center 1ST floor
623 S University Boulevard
Nampa, Idaho 83686

RE: Research Proposal Access to District Records for Ms. Valerie Fuhriman-Cleverly

Dear HRRC Members:

This letter is to inform the HRRC of Northwest Nazarene University that the administration of the [redacted] School District has reviewed the proposed dissertation research plan presented by Valerie Fuhriman-Cleverly, which included the proposed subjects, data and collection procedures, data analysis, and purpose of the study. Ms. Fuhriman-Cleverly has permission to conduct her research within the [redacted] School District. The authorization dates for this research study are July 2013 to April 2014.

Respectfully,

Dr. [redacted] Ed. D.
Superintendent
[redacted] School District
[redacted]

Appendix G

Human Research and Review Committee Approval

Valerie Fuhriman-Cleverly< vfuhriman-cleverly@nnu.edu>

Full Approval of protocol : The Academic and Linguistic Effectiveness of a Dual Language Program...

Ronald Strohmeyer< rwstrohmeyer@nnu.edu> Fri, Jun 14, 2013 at 12:43 PM
To: Valerie Fuhriman-Cleverly <vfuhriman-cleverly@nnu.edu>, Russell Joki <rjoki@nnu.edu>
Cc: Ronald Strohmeyer <RWStrohmeyer@nnu.edu>, Sandy Blom <slblom@nnu.edu>

Congratulations, you have been granted full approval on your protocol. You may begin your research. We wish you well.

--
Ron Strohmeyer, Ph.D.
Associate Professor, Biology
Northwest Nazarene University
623 S. University Blvd
Nampa, ID 83686
rwstrohmeyer@nnu.edu
208-467-8335

Appendix H

SPSS Data Analysis for Non-ELL Students

Table 34

Reading Score Statistics From SPSS for Non-ELL Students

Statistic	LC –Non ELL Reading	NS –Non ELL Reading
Number	36	36
Mean	220.806	219.139
Standard Deviation	12.345	10.535

Table 35

Reading Score Paired T-Test Results From SPSS for Non-ELL Students

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC Non-ELL Reading – NS Non-ELL Reading	1.667	14.523	-3.247	6.581	**.689**	35	**.496**

The results of the reading *t*-test for Non-LEP students generated a *p* value of .496 which is >.05 indicating that there is no statistically significant difference between the reading achievement of Los Campos students and their like peers from their neighborhood schools.

Table 36

Language Usage Score Statistics From SPSS for Non-ELL Students

Statistic	**LC –Non ELL Language Usage**	**NS –Non ELL Language Usage**
Number	36	36
Mean	222.694	220.111
Standard Deviation	10.552	8.066

Table 37

Language Usage Score Paired T-Test Results From SPSS for Non-ELL Students

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC non-LEP Language Usage – NS non-LEP Language Usage	2.583	10.737	-1.049	6.216	**1.444**	35	**.158**

The results of the language usage *t*-test for Non-LEP students generated a *p* value of .158 which is >.05 indicating that there is no statistically significant difference between the language usage achievement of Los Campos students and their like peers from their neighborhood schools.

Table 38

Math Score Statistics From SPSS for Non-ELL Students

Statistic	**LC –Non ELL Math**	**NS –Non ELL Math**
Number	36	36
Mean	220.861	222.306
Standard Deviation	14.088	11.688

Table 39

Math Score Paired T-Test Results From SPSS for Non-ELL Students

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC non-LEP Math – NS non-LEP Math	-1.444	15.253	-6.605	3.716	**-.568**	35	**.574**

The results of the math *t*-test for Non-LEP students generated a *p* value of .574 which is >.05 indicating that there is no statistically significant difference between the math achievement of Los Campos students and their like peers from their neighborhood schools.

Table 40

Science Score Statistics From SPSS for Non-ELL Students

Statistic	**LC –Non ELL Science**	**NS –Non ELL Science**
Number	36	36
Mean	217.833	212.944
Standard Deviation	11.214	9.077

Table 41

Science Score Paired T-Test Results From SPSS for Non-ELL Students

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC non-LEP Science – NS non-LEP Science	4.889	12.766	.569	9.208	**2.298**	35	**.028**

The results of the science *t*-test for Non-LEP students generated a *p* value of .028 which is <.05 indicating that there is a statistically significant difference between the science achievement of Los Campos students and their like peers from their neighborhood schools. The students from Los Campos out performed their like peers.

Appendix I

SPSS Data Analysis for Hispanic-Latino Students

Table 42

Reading Score Statistics From SPSS for Hispanic-Latino Students

Statistic	LC –Hispanic-Latino Reading	NS –Hispanic-Latino Reading
Number	26	26
Mean	211.231	216.808
Standard Deviation	11.108	10.484

Table 43

Reading Score Paired T-Test Results From SPSS for Hispanic-Latino Students

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC Hispanic-Latino Reading– NS Hispanic-Latino Reading	-5.577	13.029	-10.839	.314	**-2.182**	25	**.039**

The results of the reading *t*-test for Hispanic-Latino students generated a *p* value of .039 which is <.05 indicating that there is a statistically significant difference between the reading

achievement of Los Campos students and their like peers from their neighborhood schools. The students from the neighborhood schools out performed the students from Los Campos.

Table 44

Language Usage Score Statistics From SPSS for Hispanic-Latino Students

Statistic	**LC –Hispanic-Latino Reading**	**NS –Hispanic-Latino Reading**
Number	26	26
Mean	213.423	213.846
Standard Deviation	10.973	9.332

Table 45

Language Usage Score Paired T-Test Results From SPSS for Hispanic-Latino Students

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC Hispanic-Latino Language Usage– NS Hispanic-Latino Language Usage	-.423	11.374	-5.017	4.171	**-.190**	25	**.857**

The results of the language usage *t*-test for Hispanic-Latino students generated a *p* value of .857 which is >.05 indicating that there is not a statistically significant difference between the language usage achievement of Los Campos students and their like peers from their neighborhood schools.

Table 46

Math Score Statistics From SPSS for Hispanic-Latino Students

Statistic	**LC –Hispanic-Latino Reading**	**NS –Hispanic-Latino Reading**
Number	26	26
Mean	210.539	215.154
Standard Deviation	11.656	9.207

Table 47

Math Score Paired T-Test Results From SPSS for Hispanic-Latino Students

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC Hispanic-Latino Math– NS Hispanic-Latino Math	-4.615	13.026	-9.877	.646	**-1.807**	25	**.083**

The results of the math *t*-test for Hispanic-Latino students generated a *p* value of .083 which is >.05 indicating that there is not a statistically significant difference between the math achievement of Los Campos students and their like peers from their neighborhood schools.

Table 48

Science Score Statistics From SPSS for Hispanic-Latino Students

Statistic	**LC –Hispanic-Latino Reading**	**NS –Hispanic-Latino Reading**
Number	26	26
Mean	207.615	209.923
Standard Deviation	8.104	9.633

Table 49

Science Score Paired T-Test Results From SPSS for Hispanic-Latino Students

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC Hispanic-Latino Science– NS Hispanic-Latino Science	-2.308	11.715	-7.039	2.424	**-1.004**	25	**.325**

The results of the science *t*-test for Hispanic-Latino students generated a *p* value of .325 which is >.05 indicating that there is not a statistically significant difference between the science achievement of Los Campos students and their like peers from their neighborhood schools.

Appendix J

SPSS Data Analysis for Non-Hispanic-Latino Students

Table 50

Reading Score Statistics From SPSS for Non-Hispanic-Latino Students

Statistic	LC –Hispanic-Latino Reading	NS –Hispanic-Latino Reading
Number	27	27
Mean	221.481	219.257
Standard Deviation	12.030	10.264

Table 51

Reading Score Paired T-Test Results From SPSS for Non-Hispanic-Latino Students

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC Non-Hispanic-Latino Reading– NS Non-Hispanic-Latino Reading	2.222	14.316	-3.441	7.885	**-807**	26	**.427**

The results of the reading *t*-test for non-Hispanic-Latino students generated a *p* value of .427 which is >.05 indicating that there is a statistically significant difference between the reading achievement of Los Campos students and their like peers from their neighborhood schools.

Table 52

Language Usage Score Statistics From SPSS for Non-Hispanic-Latino Students

Statistic	**LC –Hispanic-Latino Reading**	**NS –Hispanic-Latino Reading**
Number	27	27
Mean	224.074	221.444
Standard Deviation	9.999	7.742

Table 53

Language Usage Score Paired T-Test Results From SPSS for Non-Hispanic-Latino Students

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC Non-Hispanic-Latino Language Usage– NS Non-Hispanic-Latino Language Usage	2.629	11.163	-1.787	7.046	**1.224**	26	**.232**

The results of the language usage *t*-test for non-Hispanic-Latino students generated a *p* value of .232 which is >.05 indicating that there is a statistically significant difference between the language usage achievement of Los Campos students and their like peers from their neighborhood schools.

Table 54

Math Score Statistics From SPSS for Non-Hispanic-Latino Students

Statistic	**LC –Hispanic-Latino Reading**	**NS –Hispanic-Latino Reading**
Number	27	27
Mean	223.444	223.852
Standard Deviation	13.726	12.455

Table 55

Math Score Paired T-Test Results From SPSS for Non-Hispanic-Latino Students

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC Non-Hispanic-Latino Math– NS Non-Hispanic-Latino Math	-.407	16.075	-6.766	5.952	**-.132**	26	**.896**

The results of the math *t*-test for non-Hispanic-Latino students generated a *p* value of .896 which is >.05 indicating that there is a statistically significant difference between the math achievement of Los Campos students and their like peers from their neighborhood schools.

Table 56

Science Score Statistics From SPSS for Non-Hispanic-Latino Students

Statistic	**LC –Hispanic-Latino Reading**	**NS –Hispanic-Latino Reading**
Number	27	27
Mean	219.963	213.444
Standard Deviation	10.921	9.787

Table 57

Science Score Paired T-Test Results From SPSS for Non-Hispanic-Latino Students

	Paired Differences				*t*	*df*	Sig. (two-tailed)
	Mean	Std. Deviation	95% Confidence Interval of the Difference				
			Lower	Upper			
LC Non-Hispanic-Latino Science– NS Non-Hispanic-Latino Science	6.518	13.478	1.187	11.850	**2.513**	26	**.018**

The results of the science *t*-test for non-Hispanic-Latino students generated a *p* value of .018 which is <.05 indicating that there is a statistically significant difference between the

science achievement of Los Campos students and their like peers from their neighborhood schools. The students from Los Campos out performed their like peers.