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by

Evelyn Castro

April 2017

FROM THE MICRO TO THE MACRO:  
GLEANNING THE DISCRETE ELEMENTS THAT CONTRIBUTE TO  
SUCCESSFUL STUDENT OUTCOMES IN DUAL LANGUAGE EDUCATION  
PROGRAMMING

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

In Partial Fulfilment  
of the Requirements for the Degree

Doctor of Education  
in Professional Leadership

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April 2017

## Dedication

Dream. Persist. Persevere. Pursue. May these words serve as your mantra.

First, I would like to dedicate this study to serve as an inspiration to my granddaughter, Natalie, to other grandchildren and generations to follow. Dream, persist, persevere, and pursue your goals and aspirations. You can accomplish anything you set your mind to do. Remember to love the Lord, your God, with all your heart, with all your soul, with all your mind. Cherish these precepts and tie them close to your heart.

“Therefore know that the LORD your God, He *is* God, the faithful God who keeps covenant and mercy for a thousand generations with those who love Him and keep His commandments;” Deuteronomy 7:9.

“The fear of the Lord is the beginning of wisdom, And the knowledge of the Holy One is understanding. “Proverbs 9:10.

“Trust in the LORD with all your heart, And lean not on your own understanding; In all your ways acknowledge Him, And He shall direct your paths.” Proverbs 3:5-6.

Secondly, I would like to dedicate this study to inspire other students who may have been marginalized at some point during your schooling to pursue your dreams and aspirations. You can conquer the odds. Persist! Persevere! Pursue!

## Acknowledgements

“Now faith is the substance of things hoped for, the evidence of things not seen.” Hebrews 11:1. I could not have accomplished this feat without having faith. First, I would like to acknowledge God for giving me strength to accomplish this dream. I would also like to acknowledge my family. To Francisco, my husband, thank you for being patient and supporting me through this journey. To my son, Joshua, and my beautiful daughter-in-law, Julie, thank you for encouraging me through the journey. To my mom, I thank you for praying for me and for instilling in me the value of education. Dad, although, you are no longer with us, you would have encouraged me to pursue my dreams. I also want to thank my sisters, Marybelle and Lilly, for encouraging me.

I would also like to thank Gracie for encouraging me to return to school and pursue my dreams. Finally, I want to express my gratitude to my chair and my committee for sharing your guidance and expertise through the writing process. You lead with excellence and inspire me to do follow your footsteps.

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### Abstract

The necessity to find a tool to aid in monitoring and evaluating the effectiveness of the dual language program was born at the micro level from practitioners in the field—school leaders, teachers, instructional coaches, and district support personnel—with the goal of striving to continue to ensure successful student outcomes. The purpose of the study is that the dissemination of an online survey comprised of 82 deconstructed items for three strands—curriculum, instruction, and family and community—stemming from the original *Guiding Principles for Dual Language Education* instrument could further aid in informing programming and implementation decisions. The research method for this quantitative study utilized principal components analysis. The null hypothesis stated that there would be no change and that all 82 discrete elements would emerge after conducting principal components analysis. The alternative hypothesis is that there would be a change and that the 82 items would be reduced by about half resulting in 40 items. The findings showed that the 82 items were reduced to 17 components; therefore, the null hypothesis was rejected in favor of the alternative hypothesis. Identifying the discrete elements from practitioners in the field at the micro level could further assist to inform the practice, policy development, and research at the macro level. First, practitioners can utilize the findings to impact the practice by setting goals and executing changes to inform programming and implementation decisions. At the

macro level, policies could be enacted at the state and national level to expand program offerings. The findings could germinate further research to aid in the development of additional tools to facilitate monitoring and evaluating the program.



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## **Chapter I**

### **Introduction**

In a six-year study titled *Investigating the Links to Improved Student Learning: Final Report of Research Findings*, Louis, Leithwood, Wahlstrom, and Anderson (2010) corroborate the claim exhumed from a body of research over the last decades that leadership is second only to classroom instruction as an influence to improved student outcomes. Furthermore, scholars postulate that to obtain large effects on student learning, leadership is critical because it serves as a catalyst to leverage synergy among relevant variables (Louis et al., 2010). Effective school leadership is characterized by shared leadership, a higher level of engagement from a broader array of stakeholders—teachers, parents, students, community, and district leaders (Louis et al., 2010). Furthermore, effective leadership provides more opportunities for influence by its constituents (Louis et al., 2010). Given the empirical link between adept leadership and improved student learning, both at the national and state level effective educational leadership standards are set to aid in guiding instructional programming implementation as well monitoring and evaluating the effectiveness of its instructional programs.

At the national level, the 2015 Professional Standards for Educational Leaders (PSEL) posit that effective educational leadership should not only facilitate offering high-quality instructional programs, but also has an ethical obligation and responsibility to monitor and evaluate the effectiveness of its instructional programs and implement interventions to ensure high-quality, rigorous programs with the goal of increased student outcomes (National Policy Board for Educational Administration, 2015). Concomitant with the Professional Standards for Educational Leadership for the context of the study,

the intended audience for the standards refers to the principal, assistant principal, superintendent, and other district leaders who engage in leading or supporting teaching and learning at a campus or school district. In addition to educational leadership standards guiding programming implementation and evaluation, the reauthorizations of the Elementary and Secondary Act of 1965 via the enactments of No Child Left Behind (NCLB) in 2002 and Every Student Succeeds Act (ESSA) in 2015 at the federal level charge state and local agencies via the means of its educational leadership to offer high quality, rigorous instructional programs to all students as well as language support services to English learners (ELs). Furthermore, both enactments, Every Student Succeed Act like its predecessor No Child Left Behind, include provisions and stipulations to monitor and evaluate effectiveness of district's ELs program to ensure that these students attain English proficiency and develop high levels academic achievement in English (U.S. Department of Education, 2017b, 2017c).

Particularly, the state statutes in Texas, the state of the study district, stipulate standards for evaluation of dual language immersion program models as follows: "A school district implementing a dual language immersion program must conduct annual formative and summative evaluations collecting a full range of data to determine program impact on student academic success" (Texas Education Agency, 2016, p. 36). As part of examining a full range of data to aid in monitoring and evaluating the effectiveness of the dual language program—"including the results of statewide student assessments data in English and Spanish (if appropriate); norm-referenced standardized achievement tests in both languages; and/or language proficiency tests in both languages" (Texas Education Agency, 2016, p. 36)—it would be fitting to examine the quality of implementation

relative to the national standards for dual language education beginning with a needs assessment.

A point of clarification is offered in this section regarding the various terms utilized in legislation and in the literature referring to a language minority student. For the content of this study, the term language minority student will be replaced with English language learners (ELLs). However, it is important to note that the following terms are used interchangeably and may be cited in the literature and other scholarly work on the topic: National Origin Minority Students, Origin Language Minority Students, Limited English Proficient (LEP), English learners (ELs), and English language learners (ELLs). After the introduction, the remainder of Chapter I addresses the following: purpose of the study, background of the problem, importance of the study, definition of terms, research design, scope of the study, and summary.

### **Purpose of the Study**

Given the extant robust body of research reporting the high academic success of English learners having participated in well-implemented dual language immersion programs scoring average to above average on norm-referenced standardized tests and criterion-referenced tests of reading and other subjects in English relative to non-English learners in English only classrooms (Thomas & Collier, 1997, 2002, 2009, & 2012), it is imperative that educational leaders monitor and evaluate the effectiveness of the dual language program to ensure academic success. In the *Guiding Principles for Dual Language Education* document, renowned scholars in the field of dual language education Howard, Sugarman, Christian, Lindholm-Leary, and Rogers (2007) cite that “An examination of the investigations reviewed here points to a set of consistent factors

that tend to contribute to successful student outcomes in schools in general and dual language programs in particular” (p. 7). Having identified a set of consistent factors that tend to contribute to successful student outcomes in dual language education serves as the premise for the study. Therefore, after conducting principal components analysis for 82 items for 3 strands—curriculum, instruction, and family and community—the aim of the study is that it would yield a reduced list of discrete elements that would consequently serve as critical elements that contribute to successful student outcomes in dual language education. These critical elements could serve to inform programming and implementation decisions.

It is fitting to note that for the context of the study, in addition to the state statutes mandating the evaluation of the dual language program, the necessity to find a tool to aid in monitoring and evaluating the effectiveness of the dual language program was born at the micro level from practitioners from the field—school leaders, teachers, instructional coaches, and district support personnel—with the goal of striving to continue to ensure successful student outcomes. In seeking for a tool to aid in monitoring and evaluating the dual language program, the *Guiding Principles for Dual Language Education* instrument emerges as recommended tool by renowned scholars in the field (Collier & Thomas, 2014). The instrument is identified as rating templates presented in a survey format; therefore, for the context of the study, the instrument will be referred to as a survey. When examining the utility of the original national *Guiding Principles for Dual Language Education* paper-and-pencil survey, however, the statements are comprised of double and triple barrel statements. The latter presents a challenge for practitioners in the field to identify which individual item should be measured in the first place, but it is

nearly impossible to measure a discrete element independently at a time. While this study is not a program evaluation, the purpose of the study is that by disseminating a deconstructed survey stemming from the original national *Guiding Principles for Dual Language Education* survey and conducting principal components analysis (PCA), the results would yield a reduced list of discrete elements that are critical contributors to effective dual language programming that could further aid in monitoring the effectiveness of the program and consequently impacting favorably student achievement.

The following three questions frame this study:

1. What are the discrete elements stemming from the curriculum strand from the *Guiding Principles for Dual Language Education* deconstructed survey that could further be examined to inform programming decisions?
2. What are the discrete elements stemming from the instruction strand from the *Guiding Principles for Dual Language Education* deconstructed survey that could further be examined to inform implementation decisions?
3. What are the discrete elements stemming from the family and community strand from the *Guiding Principles for Dual Language Education* deconstructed survey that could further be examined to inform implementation decisions?

For the context of this study, the revised survey is an online survey comprised of deconstructed items relevant to three strands: curriculum, instruction, and family and community. To address the discrete elements that could be utilized to inform programming, the deconstructed items from the curriculum strand are included in the online survey. To address the discrete elements that could inform implementation, the



deconstructed items from the instruction and family and community strand are included in the online survey respectively.

### **Background of the Problem**

Part of the challenge with the original *Guiding Principles for Dual Language* instrument, a national widely used paper-and-pencil survey, is that it is comprised of double and triple barreled type of statements and would need to be deconstructed to aid in identifying the discrete elements to be measured in the first place. After having deconstructed the original 103 key points present in the survey, the results yielded a total of 245 discrete elements. Although Howard et al. (2007) recommend using the original survey as a tool for self-reflection, planning, and evaluation, it is difficult to identify which element is to be measured in the first place and much less being able to measure an individual element independently at a time. Not being able to identify which discrete elements to measure presents several challenges. One challenge is that the intent of the survey is not being met. The survey is supposed to serve as a self-reflection, planning, and evaluation tool. Additionally, not being able to identify which particular elements are areas of strength or which are areas in need of improvement impedes schools from effectuating changes in areas needing improvement, such as curriculum, instruction, and professional development. Consequently, schools are not able to utilize the results from the survey to set goals and enact changes to improve the implementation of the dual language programming and ultimately favorably affect student achievement.

The online survey that was disseminated to schools will contain only three strands. Since the original survey is lengthy, after having deconstructed each key point, it contains 245 discrete elements. The revised survey, the online survey, has been

streamlined to contain only 82 items. Additionally, because a large portion of the target audience for the online survey was teachers, the online survey included the strands that teachers have most direct involvement in the areas of programming and implementation of the dual language program, that is, curriculum, instruction, and family and community. For the curriculum strand, after deconstructing each key point, a total of 24 discrete elements were derived out of the original 11 key points. For the instruction strand, after deconstructing each key point, a total of 37 discrete items were derived out of the original 18 key points. In reference to the family and community strand, after deconstructing each key point, a total of 21 discrete elements were derived out of the original 10 key points; therefore, the online survey was comprised of 82 discrete elements.

### **Importance of the Study**

Given the extant research findings of English language learners' higher academic achievement after having participated in well implemented dual language programs, it is paramount that educational leaders not only offer high-quality dual language programs, but also monitor and evaluate the effectiveness of the same. As part of examining a full range of data to determine program impact on student academic success, in addition to utilizing the results of statewide student assessment data, the quality of the implementation relative to the national principles for dual language education should also be incorporated to determine the effectiveness of the program; therefore, it is imperative to identify the discrete elements and best practices that contribute to student success so that these critical elements and practices could be duplicated and more opportunities for increased student success can be offered to English language learners.

The influx of English learners (ELs) in public schools across the United States, compels the state and local education agencies (SEAs and LEAs) to meet their legal obligations to English learners (ELs) to participate meaningfully and equally in educational programs under the U.S. Constitution, civil rights laws, No Child Left Behind (NCLB), and other federal legislation. In the state of Texas alone, 899,780 ELs, referred to as English language learners (ELLs) in the state's statute, account for 17.5% of the total student population of 5,135,880 according to Texas Education Agency's (TEA) (2015) Texas Academic Performance Report 2013-14 State Profile (p. 34). It is the SEAs and LEAs obligation to offer language assistance services to these students with the goal of achieving linguistic and academic proficiency and participating equitably in the standard instructional program within a reasonable period of time. Particularly in the state of Texas, state statutes mandate that the local education agencies provide bilingual and ESL services to meet the affective, linguistic, and cognitive needs of English language learners.

Finally, identifying the discrete elements from practitioners in the field at the micro level could further assist to inform the practice, policy development, and research in the field at the macro level. First, practitioners such as campus administrators, teachers, and district support leaders, could impact the practice by setting goals and executing changes to improve the implementation of the dual language program, increasing student achievement and ultimately aiding to close the achievement gap for English language learners. At the macro level, policies could be enacted at the state and national level that frame program design based on the discrete elements fostering the expansion of program offerings. Additionally, the findings of this study could germinate

research in the field to further examine the internal and external social, economic, and political factors associated with successful student outcomes and effective program implementation in school districts across the state and the nation striving to continue to advance dual language programming.

### **Definition of Terms**

The following terms will be used throughout the research study. The definitions will aid in the understanding educational programming for ELLs in Texas and the United States.

- *Dual language immersion/one-way* is a biliteracy program model that serves only students identified as limited English proficient. This model provides instruction in both English and Spanish, or another language, and transfers a student to English-only instruction. Instruction is provided to English language learners in an instructional setting where language learning is integrated with content instruction. Academic subjects are taught to all students through both English and the other language. The primary goals of a dual language immersion program model are: the promotion of bilingualism, biliteracy, cross-cultural awareness, and high academic achievement. (Texas Education Agency, 2016, p. 22)
- *Dual language immersion/two-way* is a biliteracy program model that integrates students proficient in English and students identified as limited English proficient. This model provides instruction in both English and Spanish, or another language, and transfers a student identified as limited English proficient to English-only instruction. Instruction is provided to both

native English speakers and native speakers of another language in an instructional setting where language learning is integrated with content instruction. Academic subjects are taught to all students through both English and the other language. The primary goals of a dual language immersion program model are: the promotion of bilingualism, biliteracy, cross-cultural awareness, and high academic achievement. (Texas Education Agency, 2016, p. 21)

- *English learner (EL)* refers to a person who is in the process of acquiring English and has another language as the first native language. The terms English learner and English language learner are used interchangeably. (U.S. Department of Education & U.S. Department of Justice, 2015)
- *English language learner (ELL)* refers to a person who is in the process of acquiring English and has another language as the first native language. The terms English language learner and limited English proficient student are used interchangeably. (Texas Education Agency, 2016, p. 16)
- *English as a second language/content-based* program model is an English program that serves only students identified as English language learners by providing a full-time teacher certified under the Texas Education Code (TEC), §29.061(c), to provide supplementary instruction for all content area instruction. The program integrates English as a second language instruction with subject matter instruction that focuses not only on learning a second language, but using that language as a medium to learn mathematics, science,

social studies, or other academic subjects. (Texas Education Agency, 2016, p. 23)

- *English as a second language/pull-out program* model is an English program that serves only students identified as English language learners by providing a part-time teacher certified under the TEC, §29.061(c), to provide English language arts instruction exclusively, while the student remains in a mainstream instructional arrangement in the remaining content areas. Instruction may be provided by the English as a second language teacher in a pull-out or inclusionary delivery model. (19 TAC §89.1210)
- *Limited English proficient (LEP)* refers to a limited English proficiency individual. This term is applied to an individual (Linquanti & Cook, 2013, p. 4).
  - (A) who is aged 3 through 21;
  - (B) who is enrolled or preparing to enroll in an elementary school or secondary school;
  - (C) who was not born in the United States or *whose native language is a language other than English*;
    - (i) who is a Native American or Alaska Native, or a native resident of the outlying areas; and
    - (ii) who comes from an environment where a language other than English has had a significant impact on the individual's level of English language proficiency; or

- (iii) who is migratory, whose native language is a language other than English, and who comes from an environment where a language other than English is dominant; and
- (D) whose difficulties in speaking, reading, writing, or understanding the English language *may* be sufficient to deny the individual—
- (i) the ability to meet the State’s proficient level of achievement on State assessments described in section 1111(b)(3)
  - (ii) the ability to successfully achieve in classrooms where the language of instruction is English; or
  - (iii) the opportunity to participate fully in society (Linguanti & Cook 2013, p. 4).
- *National origin- or language minority students* is the term used in the 2001 No Child Left Behind (NCLB) legislation to refer to English learners (ELs).
  - *Transitional bilingual/early exit* is a bilingual program model that serves a student identified as limited English proficient in both English and Spanish, or another language, and transfers the student to English-only instruction. This model provides instruction in literacy and academic content areas through the medium of the student's first language, along with instruction in English oral and academic language development. Non-academic subjects such as art, music, and physical education may also be taught in English. (Texas Education Agency, 2016, p. 21)
  - *Transitional bilingual/late exit* is a bilingual program model that serves a student identified as limited English proficient in both English and Spanish, or

another language, and transfers the student to English-only instruction.

Academic growth is accelerated through cognitively challenging academic work in the student's first language along with meaningful academic content taught through the student's second language, English. The goal is to promote high levels of academic achievement and full academic language proficiency in the student's first language and English. (Texas Education Agency, 2016, p. 21)

### **Research Design**

Principal components analysis (PCA) associated with exploratory factor analysis will be utilized to cluster the discrete elements and yield a reduced list of elements that are critical contributors to effective program implementation that could potentially be measured to inform programming and implementation decisions. After having deconstructed the original 103 key points statements present in the survey, the results yielded an increase to 245 discrete elements.

The online survey that was disseminated to schools contains only three strands. Because the original survey is lengthy with 245 discrete elements, the online survey has been streamlined to contain only 82 items based on a deconstruction of each of the key points of the original survey. Additionally, because a large portion of the target audience for the online survey was teachers, the online survey included the strands that teachers have most direct involvement in the areas of programming and implementation of the dual language program, that is, curriculum, instruction, and family and community. For the curriculum strand, after deconstructing each key point, a total of 24 discrete elements were derived out of the original 11 key points. For the instruction strand, after



deconstructing each key point, a total of 37 discrete items were derived out of the original 18 key points. In reference to the family and community strand, after deconstructing each key point, a total of 21 discrete elements were derived out of the original 10 key points. Therefore, the online survey has been reduced to and is comprised of 82 discrete elements.

The null hypothesis was that there would be no change and that all 82 discrete elements included in the online survey would emerge from utilizing principal components analysis, a technique associated with exploratory factor analysis. The alternative hypothesis was that there would be a change and that a reduced number of discrete elements would emerge from statistical clustering analysis. Specifically, principal components analysis was conducted to determine the necessity of all 82 discrete elements versus a reduced number by approximately one half resulting in less than 40 discrete elements that could serve as critical contributors to effective dual language programming to inform programming and implementation decisions.

### **Scope of the Study**

The scope of the study involved disseminating the revised survey as an online instrument, containing only 82 items of the original 245 elements, three strands of the original seven, and a selective number of key points per strand, as aforementioned in the Research Design section. Since the study stems from utilizing the results of the *Guiding Principles for Dual Language Education* survey, it would be fitting to use cluster sampling, a naturally occurring group, of current staff members that support the implementation dual language program or teach dual language students—principals, assistant principals, teachers (assigned to dual language homeroom), ancillary teachers,

coordinators, and teacher specialists—at schools currently implementing the dual language program. Teachers are defined as the one assigned to a dual language homeroom, teaching dual language students for the entire instructional day in a self-contained or teaming setting. Ancillary teachers teach dual language students part of the time via art, physical education, music, etc. Additionally, teacher development specialists (TDS), dual language coaches, and multilingual programs department (MPD) Specialists, dual language programming specialists, will be asked to participate taking the online survey.

### **Summary**

Given the extant research findings of English language learners' higher academic achievement having participated in well implemented dual language programs, it is of utmost importance to identify the critical elements and best practices that contribute to student success so that these practices can be duplicated and more opportunities for increased student success can be offered to English language learners across the state and the nation. While the document *Guiding Principles for Dual Language Education* may offer a contribution to the advancement of dual language education and can serve as a tool for planning, self-reflection, and growth, opportunity exists to refine the *Guiding Principles for Dual Language Education* survey. The aim is that the survey can also serve as a tool to identify areas of strength and areas for improvement so that schools can set goals and enact changes to improve the implementation of the dual language programming and ultimately increase student achievement.

When critically examining the utility of the survey and analyzing each principle and its corresponding key points within each strand, it is difficult not only to identify

which element is to be measured in the first place, but it is nearly impossible to measure a discrete element independently at a time. Most key points are replete with layered linked elements within each statement, double, tripled, and sometimes multiple-linked elements. After conducting principal components analysis and consolidating the critical elements, it is recommended that the survey be restructured and streamlined utilizing a reduced list of critical elements to increase the validity and reliability of the measureable guiding principles for dual language education.

Given the extant research findings of English language learners' higher academic achievement having participated in well implemented dual language programs, it is imperative that educational leaders integrate tools that aid in measuring the effectiveness of the dual language program. To this end the type and quality of the educational inputs, the "receiving gap" is critical (Venzant Chambers, 2009). The "receiving gap" challenges educational leaders to examine the type and quality of the educational inputs. Just as educational inputs can be conducive to optimize learning, there is an array of inputs that can cause counterproductive effects. School tracking policies, lack of teacher quality, disproportionate discipline sanctions extended to minority students, as well as the lack of funding equity have been associated with exacerbating the achievement gap; therefore, it is imperative that educational leaders examine the type and quality of the educational inputs by integrating measures to determine the effectiveness of the instructional programs. Particularly, for the purpose of this study, the aim is that by disseminating a deconstructed survey stemming from the original national *Guiding Principles for Dual Language Education* survey and conducting principal components analysis (PCA), the results would yield a reduced list of discrete elements that are critical

contributors to effective dual language programming that could further aid in monitoring and evaluating the effectiveness of the program and consequently impacting increased student achievement.

## **Chapter II**

### **Literature Review**

#### **Introduction**

In the previous chapter, the purpose of the study, background of the problem, and the importance of the study was presented at length. As previously mentioned, the necessity to find a tool to aid in monitoring and evaluating the effectiveness of the dual language program was born at the micro level from practitioners in the field - school leaders, teachers, instructional coaches, and district support personnel- with the goal of striving to continue to ensure successful student outcomes. This chapter strives to share empirical evidence regarding the success of dual language programming, some of the opposing views to bilingual education, as well as the federal and state legislation that mandate that language support services be offered to English language learners. Specifically, this chapter presents a discussion of the following topics: dual language education: high academic achievement for ELLs; opposing views to bilingual education; federal legislation for English language learners, state programming for English language learners; English language learners' definition, identification, placement, and exiting; study district language support services; the guiding principles for dual language education; and a summary.

#### **Dual Language Education: High Academic Achievement for ELLs**

A robust body of research shows that the English language learners who have participated in high-quality immersion programs perform at grade level or above on various measures of academic achievement relative to their peers who are not enrolled in a dual language program (Lindholm-Leary, 2001). In *Profiles in Two-Way Education*

*Immersion Education*, Christian, Montone, Lindholm and Carranza (1997) examine the two-way immersion program at three school sites: Frances School Key Elementary School in Arlington, Virginia, offering a 50:50 model, River Glen part of San Jose Unified School District in California offering a 90:10 model, and Inter-American Magnet School (IAMS) in Chicago, IL offering 80:20 programming. Various standardized tests were administered at each site in English and Spanish. At Key, the Iowa Test of Basic Skills (ITBS) was administered in English to fourth grade students in the subtests of language, mathematics, reading comprehension, social studies, and science (Christian et al., 1997). Spanish speaking students and native English speaking students exceeded on the average as compared to their peers within the school, the district, and the state in all subtests (Christian et al., 1997). At River Glen, in Grades 3-7 the Comprehensive Test of Basic Skills (CTBS) was administered in English in three areas: language, reading, and mathematics. Taking into account that English reading did not begin until seventh grade, Spanish speakers' performance varied considerably (Christian et al., 1997). Christian et al., (1997), p. 10, cite that "Performance in English reading increased steadily across the grade levels and reached the 50th percentile by seventh grade. However, English speakers scored at or above the 50th percentile from third grade on." As for the Inter-American Magnet School, the Illinois Goals Assessment Program (IGAP) is administered every year in reading, mathematics, and writing in Grades 3, 6, and 8; science and social studies are tested in Grades 4 and 7 (Christian et al., 1997). Results from the IGAP were that both the English and Spanish background students performed far better than their district peers, and in many cases outperforming students in the state as a whole (Christian et al., 1997).

In Lindholm-Leary's (2001) large-scale, longitudinal dual language education (DLE), Two-Way Immersion study, native Spanish speakers (NSS), (limited English proficient students whose first language is Spanish) and native English speakers (NES), both sets of students, showed high levels of academic achievement in the content area, reading, and language in their first and second language respectively. In this study, L1 refers to the first language, Spanish, and L2 refers to the second language, English. Relevant to their reading achievement, Lindholm-Leary (2001), p. 232, reported the following:

In considering both L1 and L2 reading achievement, results showed the important influence of bilingual proficiency on students' reading achievement scores. While this finding was not as robust for English speakers in English reading, it was certainly true for English speakers in Spanish reading and for Spanish speakers in English and Spanish reading.

While the performance trend for limited English proficient (LEP) students in reading achievement in English may have begun at low levels in the primary grades, it increased to the average range as the students became more proficient in the second language throughout the upper grades (Lindholm-Leary, 2001). Lindholm-Leary (2001), p. 233, further reported that "DLE former-LEP students outscored their LEP peers across the state." As for the English speakers, these students scored as well as or superior to their English monolingual peers in English-only instruction in tests of English reading and language achievement (Lindholm-Leary, 2001). Additionally, Lindholm-Leary (2001) further explained that the English speakers could read and write in Spanish, while their English monolingual counterparts could not.

Lindholm-Leary, (2001), p. 233, concluded the following:

In sum, these results clearly show that both English and Spanish speaking students benefited from instruction in DLE programs. These findings are true regardless of the students' background characteristics (ethnicity, socioeconomic class, gender, language background, and grade level), program type (90:10, 50:50) or school characteristics (90LO, 90HI). (Note: 90LO refers to school sites that had fewer than 66% minority students and a low percentage of students in the free-lunch program, while 90:HI refers to school sites that had greater than 66% minority students and a high percentage of students in the free-lunch program.)

In the report, *Trends in Two-Way Immersion Education, A Review of the Research*, Howard, Sugarman, and Christian (2003) summarize the research that had been conducted to date, synthesize the main findings across studies, and identifies areas for future research. Howard et al. (2003) presents the profiles of eight exemplary TWI programs followed by an extensive summary of the academic achievement research in the field stemming from the large-scale studies of Tomas and Collier (1997, 2002) having analyzed 700,000 students to small-scale studies in the primary and upper elementary grades of new and established programs all over the U.S., with California, Massachusetts, and Texas being the most frequently represented states. The cumulative profile across studies indicates "... that both native Spanish speakers and native English speakers in TWI programs perform as well as or better than their peers educated in other types of programs, both on English standardized achievement tests and Spanish standardized achievement tests" (Howard et al., 2003, p. 19). Although variations are present in



program design and implementation; school environmental factors; staffing configurations; and student backgrounds, the consistency of the findings across studies suggests that the body of the research has credibility (Howard et al., 2003).

Part of the seminal research in the field of dual language education is Drs. Thomas and Collier's (2012) cumulative longitudinal studies summarized in "The Graph", titled *English Learners' Long Term K-12 Achievement in Normal Curve Equivalent (NCEs) on Standardized Tests in English Reading Compared across Seven Program Models*. The Graph shows a summary of the research findings of many longitudinal evaluations of school programs for English Learners over the past 28 years working with 35 school districts in 16 states within the U.S., including two federally funded studies (Thomas & Collier, 1997, 2002, 2009, & 2012). In this study, the performance of ELLs in English reading is compared relative to average performance of the norm group, native English speakers across the United States on the English reading test at each grade level scoring at the 50<sup>th</sup> percentile, normal curve equivalent, across seven programs (Thomas & Collier, 2012). The programs involved in the study range from the most subtractive program to the most additive and are listed in the aforementioned order respectively as follows: Proposition 227 to English as a Second Language (ESL) Pull-Out, to the Transitional Bilingual Program (TBP) late-exit, to the dual language immersion model two-way. The results of the cumulative study corroborate the prevalent findings that ELLs who participate in well-implemented programs receiving instruction in students' primary language as well as English for at least six years perform at grade level and above in standardized tests in English reading and other subjects.

Finally, in referencing this longitudinal study across seven program models, Collier and Thomas (2009), p. 58, cite the following summary of the findings, “This figure clearly demonstrates that it takes an average of six years to reach grade-level achievement in second language when starting at the 20th NCE (8th percentile), and that can only be achieved in programs that provide non-stop cognitive, academic, and linguistic support to allow students to accelerate their growth by an average of one and one-half years per year for 6 years in a row.”

Collier and Thomas (2009), p. 58, further postulate the following:

The gap is closed at the average rate of 5 NCEs per year with English learners outgaining the native English speakers by about one-fourth of a national standard of deviation per year. After 6 years of such gains, the full gap (1½ standard deviations or 30 NCEs) is closed. Not many special programs provide that kind of support for the English learner.

Dual language programming is considered one of the most effective bilingual programs conducive to accelerating second language acquisition and academic achievement as well (Thomas & Collier, 2012).

### **Opposing Views to Bilingual Education**

Despite the body of scholarly work in the field of dual language education citing the academic success for English language learners (Thomas & Collier, 1997, 2002, 2009, 2012), opponents of bilingual education claim that ELLs are not learning English. This may be rightly so for some programs; however, in the extant literature review of the successful dual language programs as well as that of other successful bilingual programs,

the common denominator is a well-implemented program. Howard et al. (2003), p. 48, presents some of the factors that impede an effective implementation:

A lack of bilingual teachers and support staff; limited pedagogical materials in the minority languages, especially in the upper grades and for languages other than Spanish; the lower status of speakers of those languages in society in general; mandatory standardized achievement testing in English in the primary grades; and current political initiatives such as English-only and anti-bilingual education legislation.

At the surface level critics who have not delved into the factors that may cause the program to fail, such as the ones aforementioned, simply state that the program is not working.

**English-only legislation.** Over the past decades, the expansion of restrictive language policies has been the continuing trend evidenced in the enactment of English-only legislation in many states. In the book, *Language Loyalties: A Source book on the Official English controversy*, Crawford (1992) synthesizes the opposing views on this topic, as follows: “For supporters, English is an essential tool of social mobility and economic advancement” (p. 2-3). Crawford (1992) explains “For opponents, Official English is synonymous with English only: a mean-spirited attempt to coerce Anglo-conformity by terminating essential services in other languages” (p. 2-3). Crawford (1992) adds “It is an insult to the heritage of cultural minorities, including groups whose roots in this country go deeper than English speakers-Mexican Americans, Puerto Ricans, and American Indians” (p. 2-3).

In conclusion, at the surface level, the goal of English-only movement seems innocuous, fostering the teaching of English for the purposes of assimilation and economic advancement; however, when examining the movement at a deeper level, the agenda is beyond state and local governments providing documents and services in other languages than English. It is a covert agenda that promotes and supports anti-immigrant sentiments and anti-bilingualism. It compels schools to teach English only and not to build on English language learners' cognitive and linguistic skills from their first language to help them acquire the second one, English.

**English-official language.** According to U.S. English, Inc. (2017), 31 states have English as their official language and several more are considering similar legislation. Since 2006, Arizona, Idaho, and Kansas have enacted official English legislation with the help of U.S. English, Inc. (2017). While U.S. English, Inc. (2017) has led the movement in several states, individuals and independent organizations have led the campaign in other states. In California, for example, “the ballot initiative [Proposition 227, in 1998,] was conceived, financed, and directed by Ron Unz, a multimillionaire software developer and a former Republican candidate for governor” (Crawford, 2000, p. 106). The running ballot slogan was a euphemistic expression “English for the Children” (Crawford, 2000). With such a running slogan, who of sound mind would have voted against children’s “right” to learn English? However, the general public was not informed that the ultimate goal was to do away with bilingual education and offer in its place the one-year English structured immersion model (Crawford, 2000). It is important to note that the basic premise of total immersion is that children learn English faster if they are “totally

immersed in English.” The California legislation, Proposition 227, was confronted with failed results as Crawford (2006), p. 7, pointed out:

A five-year study, commissioned by the California legislature, found no evidence that all-English immersion programs had improved academic outcomes for English learners in the state. In 2004-05, only 9% of these students were reclassified as fluent in English – a rate that was virtually unchanged since the year before passage of the English Only law.

Similar English Only initiatives were implemented in Arizona (2000) and Massachusetts (2002) with failed results (Crawford, 2006). Crawford (2006), p. 7, cites the following findings:

Researchers at Arizona State University reported that 60% of English learners in Arizona made “no gain” in English in 2003-04, while 7% actually lost ground; all were enrolled in English Only programs. Another ASU study found that the academic achievement gap between English learners and other students was widening. In Massachusetts, more than half of the students were still limited in English after three years in structured English immersion classrooms.

The findings stated above are affirmed by the body of research in the field of dual language education. Among the seminal studies, it is that of Drs. Collier and Thomas (2009) which compares English language learners’ performance relative to that of monolingual students across seven programs including Proposition 227. As mentioned earlier, Proposition 227, refers to a referendum approved by California voters in 1998, which dictates that students not proficient in English should be immersed in a one year

intensive program to learn English (Collier & Thomas, 2009). The program advocates English-only instruction with no linguistic, cognitive, academic, or sociocultural development through the primary language. Proposition 227 provides the least amount of support for English learners (Collier & Thomas, 2009). “In fact when compared to the other ELL programs, this program type has resulted in the lowest achievement for English learners of any program in the U.S.” (Collier & Thomas, 2009, p. 61).

It is fitting to note that the California Proposition 227 was repealed by Proposition 58 in November of 2016. Proposition 58, the California Non-English Allowed in Public School Act (Senate Bill 1174) repealed the English-only immersion requirement and waiver provisions required by Proposition 227 of 1998. Proposition 58 allows schools to utilize multiple programs, including bilingual education. Pally (2006), p. 2, identifies some of the provisions contained in the law as follows:

requires that school district solicit parent and community input in developing language acquisition programs to ensure; authorizes school districts to establish dual-language immersion programs for both native and non-native English speakers; and allows parents/legal guardians of students to select an available language acquisition program that best suits their child.

Based on students failed performance having participated in the “structured immersion” English programs, it is hoped that other states will follow-suit as California and reverse the anti-bilingualism legislation in their states.

### **Federal Legislation for English Language Learners**

The protection of the educational rights of language minority students is founded in statute beginning with the U.S. Constitution (Ovando, Combs, & Collier, 2006).

Specifically, the Fourteenth Amendment to the U.S. Constitution (passed in 1868) guarantees all persons equal protection under the laws of the United States. Over the past decades, the enactment of federal legislation and court decisions has further extended the interpretation of the basic rights provided in the U.S. Constitution. “The educational rights of ‘national origin-language minority children’ are also well-established in the Title VI of the Civil Rights Act of 1964” (Public Law 88-352) (Linquanti & Cook, 2013, p. 3). Specifically, it states,

No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance. (42 USC Sec.2000d.)

Another legislation that affirmed the rights of language minority children is the Elementary and Secondary Education Act (ESEA). “It was signed into law in 1965 by President Lyndon Baines Johnson, who believed that ‘full educational opportunity’ should be ‘our first national goal’” (U.S. Department of Education, 2017a). ESEA offered new grants to districts serving low-income students, federal grants for text and library books, it created special education centers, and created scholarships for low-income college students (U.S. Department of Education, 2017a). Additionally, the law provided federal grants to state educational agencies to improve the quality of elementary and secondary education.

Specifically, in reference to bilingual education, Ovando et al. (2006), p. 63, cites that “The first federal legislation for bilingual education (the first ‘enticement’) was passed by Congress in 1968 under the Title VII of the Elementary and Secondary

Education Act.” Ovando et al. (2006), p. 63, further cites that “The Civil rights movement and the climate of social change of the 1960s had spurred the passage of legislation focusing on the special needs of minorities.” Ovando et al. (2006), p. 63, adds that “The Bilingual Education Act of 1968 represented the first national acknowledgement of some of the special educational needs of children of limited English proficiency.” Ovando et al., (2006) further point out that it was reauthorized in 1974, 1978, 1984, and 1988 with appropriations increasing each year. Ovando et al. (2006), p. 66, comments that “The introduction of developmental bilingual education (DBE) as a category of funding in the 1984 reauthorization represented another breakthrough in moving away from compensatory, remedial perspectives to viewing bilingual education as an additive, enrichment program.” The Equal Educational Opportunities Act (EEOA) of 1974 further affirms the educational rights of language minority students which requires states to ensure that an educational agency “take[s] appropriate action to overcome language barriers that impede equal participation by its students in its instructional programs” (20 USC Sec.1703(f)). The educational rights of these students are also further affirmed and upheld in case law by the rulings of the U.S. Supreme Court and the Fifth Circuit Court of Appeals respectively in *Lau v. Nichols*, 1974 and *Castañeda v. Pickard*, 1981.

In addition to the federal legislation and court cases, there are federal entities that further ensure that the ELs have equal access to a high-quality education. In January 2015, the U.S. Department of Education (ED) and Justice (DOJ) released joint guidance reminding states, school districts and schools of their obligations under federal law to ensure that English learner students have equal access to a high-quality education and the



opportunity to achieve their full academic potential (U.S. Department of Education & U.S. Department of Justice, 2015). The joint guidance from the U.S. Department of Education and the Department of Justice explains schools' obligations to education of Els from identification, to placement, to exiting. Additionally, it provides guidance regarding providing meaningful access to all curricular and extracurricular programs; avoiding unnecessary segregation of EL students; ensuring meaningful communication with limited English proficient students; and evaluating effectiveness of district's EL programs and services (U.S. Department of Education & U.S. Department of Justice, 2015). Finally, the onset of the fortieth anniversaries of *Lau v. Nichols* and Equal Educational Opportunities Act (EEOA) and the fiftieth anniversary of Civil Rights Act, further compel SEAs and LEAs of their legal obligations to ensure that English learners can participate equitably in school (U.S. Department of Education & U.S. Department of Justice, 2015).

### **State Programming for English Language Learners (ELLs)**

To set a frame of reference as to the programs offered by the state and the goal of these programs including the program of the study district, it is fitting to describe the programs models outlined by state statute. The Texas Education Agency (TEA) establishes in state statute policies for LEAs and public school districts to follow concerning language support services for educating language minority students. Specifically, the Texas Education Code (TEC) Chapter 29, Subchapter B. Bilingual Education and Special Language Programs (29.051-29.066) and Title 19 Texas Administrative Code (TAC) Chapter 89. Adaptations for Special Populations, Subchapter BB. Commissioner's Rules Concerning State Plan for Educating English Language

Learners (89.1201-89.1269), mandate that public school districts must offer program offerings to meet the affective, linguistic, and cognitive needs of language minority students, referred to as English language learners (ELLs) in the state's statutes. Both of these state statutes are contained within the *Language Proficiency Assessment Committee (LPAC) Framework Manual* (2016). For a vast remainder of this section, references to the state statutes will be cited stemming from this framework manual. Particularly, the state statutes mandate that school district offer language support services to ELLs via the medium of two main programs: bilingual education and English as a Second Language (ESL).

According to the *2014 Comprehensive Biennial Report on Texas Public Schools*, "Instructional programs in bilingual education and English as a Second language serve students in prekindergarten through Grade 12 whose primary language in not English and who have been identified as English language learners in accordance with state identification and assessment requirements (19 TAC §89.1225)" (Texas Education Agency, 2015, p. 210). The *Texas Academic Performance Report 2013-14 State Profile* reports the student enrollment in the bilingual/ESL education program combined to be 878,569 which is 17.1% of the total 5,135,880 student population (Texas Education Agency, 2015). The *Texas Academic Performance Report 2013-14 State Profile* report further cites that the English language learner population accounts for 889,780, that is 17.5% of the total 5,135,880 student population in the state (Texas Education Agency, 2015). The student population in Texas public schools is comprised of the following ethnic distribution percentages respectively: 0.1% Pacific Islander; 0.4% American Indian; 1.9% Two or More Races; 3.7% Asian; 12.7% African American; 29.4% White;

and 51.8% Hispanic, the latter accounting for the largest ethnic group according to the *Texas Academic Performance Report 2013-14 State Profile* (Texas Education Agency, 2015). It is fitting to note that “While more than 122 languages are spoken in the homes of Texas public school students, Spanish is the language spoken in 91 percent of homes in which English is not the primary language” (Texas Education Agency, 2015, p. 210). Although Spanish is spoken in 91 percent of homes in which English is not the primary language and consequently the Hispanic ethnic group accounts for slightly more than half of the student population in Texas and while a large percentage of the latter may meet the state identification criteria to be classified as English language learner, it is important to note that not all Hispanic students are necessarily identified as English language learners.

Pertaining to the bilingual education program, the state policy outlines four models as follows: (1) Transitional bilingual/early exit; (2) Transitional/late exit; (3) Dual language immersion/two-way; and (4) Dual language immersion/one-way. Both of the Transitional bilingual models, that is 1 and 2, serve students identified as English language learners in both English and Spanish, or another language, with the goal of exiting the students from the program to English-only instruction. According to the *LPAC Framework Manual* (2016), both of these models “provide instruction in literacy and academic content areas through the medium of the student’s first language, along with instruction in English oral and academic language development” (Texas Education Agency, 2016, p. 21). Although the goal of both transitional bilingual models is the same, one distinction must be noted between the transitional bilingual/early exit and the transitional bilingual/late exit. According to the *LPAC Framework Manual* (2016), in the transitional bilingual/early exit model, “Exiting a student to an all-English program of

instruction occurs no earlier than the end of Grade 1 or, if the student enrolls in school during or after Grade 1, no earlier than two years or later than five years after the student enroll in school” (Texas Education Agency, 2016, p. 21). While in the transitional bilingual/late exit model, “a student is eligible to exit the program no earlier than six years or later than seven years after the student enrolls in school” (Texas Education Agency, 2016, p. 21).

Both of the dual language immersion models mentioned earlier, that is 3 and 4, posit the same goal, the promotion of bilingualism, biliteracy, cross-cultural awareness, and high academic achievement (Texas Education Agency, 2016). Both Dual language immersion models are a biliteracy program that provides instruction in English and Spanish, or another language (Texas Education Agency, 2016). According to the *LPAC Framework Manual* (2016), “Instruction is provided in an instructional setting where language learning is integrated with content instruction” (Texas Education Agency, 2016, p. 22). The *LPAC Framework Manual* (2016) further cites that “Academic subjects are taught to all students through both English and the other language” (Texas Education Agency, 2016, p. 22). However, it is important to note one distinction between the dual language immersion/two-way and the dual language immersion/one-way. The dual language immersion/two-way is comprised of two language groups: students proficient in English referred to as native English speakers and students identified as English language learners. While the dual language immersion/one-way is comprised of one language group, students identified as English language learners who share the same first language. The program model being examined in the study district is the dual language 80:20 and 50:50 one-way and two-way immersion.

The other language support program offered in Texas is English as a Second Language (ESL) which is an intensive program of instruction designed to develop proficiency in listening, speaking, reading and writing in the English language (Texas Education Agency, 2016). According to the *LPAC Framework Manual* (2016), “Instruction in ESL shall be commensurate with the student’s level of English proficiency at his or her level of academic achievement” (Texas Education Agency, 2016, p.22). The *LPAC Framework Manual* (2016) cites that “Exiting of a student to an all-English program of instruction without English as a second language support occurs no earlier than the end of Grade 1 or, if the student enrolls in school during or after Grade 1, no earlier than two years or later than five years after the student enrolls in school” (Texas Education Agency, 2016, p. 23).

English as a second language has two program models: (1) ESL/content-based and (2) ESL/pull-out. According to the *LPAC Framework Manual* (2016), “ESL/content-based is an English program that serves only students identified as English language learners by providing a full-time teacher certified under the Texas Education Code (TEC), 29.061(c), to provide supplementary instruction for all content area instruction” (Texas Education Agency, 2016, p. 23). The ESL/content-based model integrates English as a second language instruction with subject matter instruction. The goal of the ESL/content-based model is “not only on learning a second language, but using that language as medium to learn mathematics, science, social studies, or other subjects” (Texas Education Agency, 2016, p. 23). The *LPAC Framework Manual* (2016) cites that the “The ESL/pull-out model is an English program that serves students identified as English language learners by providing a part-time teacher certified under TEC,

29.061(c), to provide language arts instruction exclusively, while the student remains in a mainstream instructional arrangement in the remaining content areas” (Texas Education Agency, 2016, p. 23). Finally, in the ESL/pull-out model, instruction may be provided by in a pull-out or inclusionary delivery model (Texas Education Agency, 2016).

**English language learners: Definition, identification, placement, and exiting definition.** *The LPAC Framework Manual* (2016) defines an English language learner as “A person who is in the process of acquiring English and has another language as the first native language” (Texas Education Agency, 2016, p. 16). In the Texas Education Code (TEC) Chapter 29, Subchapter B, a “Student of limited English proficiency means a student whose primary language is other than English and whose English language skills are such that the student has difficulty performing ordinary class work in English” (Texas Education Agency, 2016, p. 38).

At the national level, Linquanti and Cook (2013), p. 4, cite that “It is the Elementary and Secondary Education Act (ESEA)- first in its 1978 reauthorization, and further refined in 1994 [Improving America’s Schools Act] (IASA) and 2001 NCLB- which provides an explicit definition of what constitutes a ‘Limited English Proficient’ student” as follows:

The term limited English proficient, when used with respect to an individual, means an individual-

- (A) who is aged 3 through 21;
- (B) who is enrolled or preparing to enroll in an elementary school or secondary school;

(C) who was not born in the United States or *whose native language is a language other than English*;

- (i) who is a Native American or Alaska Native, or a native resident of the outlying areas; and
- (ii) who comes from an environment where a language other than English has had a significant impact on the individual's level of English language proficiency; or
- (iii) who is migratory, whose native language is a language other than English, and who comes from an environment where a language other than English is dominant; and

(D) whose difficulties in speaking, reading, writing, or understanding the English language *may* be sufficient to deny the individual—

- (i) the ability to meet the State's proficient level of achievement on State assessments described in section 1111(b)(3)
- (ii) the ability to successfully achieve in classrooms where the language of instruction is English; or
- (iii) the opportunity to participate fully in society (Linquanti & Cook, 2013, p. 4)

Part D of the definition posits that English language learners' lack of proficiency in speaking, reading, writing, or understanding the English language can impede the following: meeting achievement on state assessments; the ability to achieve successfully in English-medium classrooms; and consequently participate fully in society (Linquanti & Cook, 2013). Therefore, the challenge for English language learners lies not only in

acquiring English, but also in attaining parity with their peers in language proficiency as well the development of academic proficiency and consequently being able to participate fully and ultimately becoming contributing members of society.

**Identification.** The *Texas Education Code (TEC) Chapter 29, Subchapter B* and *Title 19 Texas Administrative Code (TAC) Chapter 89, Subchapter BB*, mandate that each school district is required to establish a language proficiency assessment committee (LPAC) or as many as necessary to discharge its duties (Texas Education Agency, 2016). The LPAC serves to fulfill four main functions during the beginning, middle, and end of the school year respectively: review pertinent information to make recommendations regarding appropriate placement in either, the bilingual or ESL program; monitor student progress; make testing recommendations regarding standardized testing; and determine if the student has met the exit criteria at the end of the school year to reclassify the student as non-ELL (Texas Education Agency, 2016). Additionally, the LPAC has the responsibility of monitoring students formerly classified as ELL who have met the exit criteria for the first two years after having met the exit criteria and having been reclassified as non-ELL (Texas Education Agency, 2016). The *Texas Education Code (TEC) Chapter 29, Subchapter B, Section §29.063* cites that the LPAC “shall include a professional bilingual educator, a professional transitional educator, a parent of a limited English proficiency student, and a campus administrator” (Texas Education Agency, 2016, p. 46).

*The LPAC Framework Manual (2016), p. 27*, cites specific procedures for identifying ELLs as follows:



For identifying English language learners, school districts shall administer to each student who has a language other than English as identified on the home language survey: in prekindergarten through Grade 1, an oral language proficiency test approved by the Texas Education Agency (TEA); and in Grades 2-12, a TEA-approved oral language proficiency test and the English reading and English language arts sections from a TEA-approved norm-referenced assessment, or another test approved by the TEA, unless the norm-referenced standardized achievement instrument is not valid in accordance with subsection (f)(2)(C) of this section (Texas Education Agency, 2016, p. 27).

According to the *LPAC Framework Manual* (2016), school districts that provide a bilingual education program shall implement the following procedures:

School districts that provide a bilingual education program shall administer an oral language proficiency test in the home language of the student who is eligible to be served in the bilingual education program. If the home language of the student is Spanish, the school district shall administer the Spanish version of the TEA-approved oral language proficiency test that was administered in English. If the home language of the student is other than Spanish, the school district shall determine the student's level of proficiency using informal oral language assessment measures (Texas Education Agency, 2016, p. 27).

**Placement.** *The LPAC Framework Manual* (2016), p. 28, cites specific procedures for determining placement as follows:

1. For entry into a bilingual education or English as a second language program, a student shall be identified as an English language learner using the following criteria.
  - a. In prekindergarten through Grade 1, the student's score on the English oral language proficiency test is below the level designated for indicating limited English proficiency under subsection (iii) of this section.
  - b. In Grades 2-12:
    - i. the student's score on the English oral language proficiency test is below the level designated for indicating limited English proficiency under subsection (iii) of this section;
    - ii. the student's score on the English reading and/or English language arts sections of the TEA-approved norm-referenced standardized achievement instrument at his or her grade level is below the 40th percentile; or
    - iii. the student's ability in English is so limited that the administration, at his or her grade level, of the reading and language arts sections of a TEA-approved norm-referenced standardized achievement instrument or other test approved by the TEA is not valid (Texas Education Agency, 2016, p. 28).

**Exiting.** The *LPAC Framework Manual* (2016) stipulate indicators for meeting exit criteria and being reclassified as non-ELL (Texas Education Agency, 2016). To meet state exit criteria, students have to demonstrate a high level of English proficiency in three main areas: score fluent in oral language proficiency; meet the passing standards

of the reading state-criterion-referenced test in this case the State of Texas Assessments of Academic Readiness (STAAR) Reading; and meet the passing standards of a Texas Education Agency (TEA) approved writing test, such as the STAAR Writing when offered in that particular grade or a score of Advanced-High on the Texas English Language Proficiency System (TELPAS) Writing for grades that do not offer the state-criterion referenced test for writing (Texas Education Agency, 2016). In Grades 1 and 2, because the state does not offer a criterion-referenced test in English reading for those grades, students must score at the 40th percentile or above on both the English reading and English language arts sections of a TEA approved norm-referenced assessment (Texas Education Agency, 2016). English language learners who meet exit criteria may continue to participate in dual language programming in middle and high school; however, meeting the exit criteria is encouraged not only for the purposes of accomplishing a milestone for ELLs in demonstrating high levels of English proficiency, but also for meeting the ELL exit status. Consequently, the ELL would be reclassified as English proficient and a non-English language learner.

### **Study District Language Support Services**

Before describing the language support services, it is fitting to describe the study district. The study district is a large urban district. The 30.29% of the student population is classified as English language learners. More than 85 languages are spoken. The student population of the study district is comprised of the following ethnic distribution percentages respectively: 0.08% Native Hawaiian/Other Islander; 0.2% American Indian/Alaskan Native; 0.99% Two or More; 3.74% Asian; 24.46% African American; 8.45% White; and 62.09% Hispanic (Facts and Figures, 2016). As noted, the Hispanic

population comprises a large portion of the student population (Facts and Figures, 2016). While not all Hispanic students are ELLs, 92% of English language learners in the study district speak Spanish.

The study district offers various language support services, such as the transitional bilingual program, dual language programming, as well as English as a second language; however, particularly, dual language programming will be examined in the study district. The dual language program offerings are characterized by two main features. One is the language distribution and the other is the demographics of the class. In reference to the language distribution, dual language programming can offer two models either, the 90:10 or 50:50. The study district offers two program models. One is the 80:20 model, originally coined as a 90:10, and the other is the 50:50. In the 80:20 model, the language distribution is 80% in the partner language and 20% in English. Specifically, in an 80:20, students are immersed in the partner language for 80% of the time, in this case Spanish, and 20% in English beginning in Kindergarten. The percentage of Spanish and English fluctuate as follows: 70:30 in first grade, 60:40 in second grade, and 50:50 in third through fifth grade. In the 50:50 model, students receive instruction half of the day in the partner language in this case Spanish and the other half of time in English in Kindergarten through fifth grade. Most programs begin in Kindergarten and that cohort moves to first grade and so forth. Some schools begin the program in Pre-Kindergarten. It is fitting to note that three of the schools are offering the 50:50 model in a partner language other than Spanish: Mandarin Chinese, Arabic, and French Immersion. These schools are referred to as specialty elementary schools and were not be included in the study.

Based on the composition of the student body of a particular classroom, the study district offers two demographic structures, the one-way and the two-way classroom setting. The one-way is comprised of one language group, English language learners whose first language is Spanish. Students in a one-way are taught the full curriculum via the heritage or partner language, in this case Spanish, as well as in English. The two-way is comprised of two language groups, English language learners, whose first language is Spanish, as well as non-ELLs, whose first language is English. In the two-way classroom, both language groups are learning the partner language, in this case Spanish, as well as English. Demographics and the language of instruction are independent features of each other and can coexist with any one combination. Both the 80:20 and the 50:50, regardless of the language distribution model, can be offered in a classroom setting of either one-way or two-way. Therefore, the study district has 80:20 models that are being implemented via a one-way classroom setting as well as a two-way. It also has 50:50 models that are offering the program via a one-way or a two-way classroom setting.

### **Guiding Principles for Dual Language Education**

In the *Guiding Principles for Dual Language Education*, Howard et al. delineates a “set of consistent factors that tend to contribute to the successful student outcomes in schools in general and dual language programs in particular” (p. 7). Howard et al. (2007) further expound that “The importance of these factors is evident from the frequency and consistency with which they are found in the programs that produce successful student outcomes” (p. 7). Having identified a set of consistent factors that tend to contribute to successful student outcomes in dual language education serves as the premise for the

study. Therefore, after conducting principal components analysis for 82 items for 3 strands—curriculum, instruction, and family and community—the aim of the study is that it would yield a reduced list of discrete elements that would consequently serve as critical elements that contribute to successful student outcomes in dual language education.

These critical elements could serve to inform programming and implementation decisions

In context of the *Guiding Principles*, Howard et al. (2007) cite that “the term *dual language* refers to any program that provides literacy and content instruction to all students through two languages and that promotes bilingualism and biliteracy, grade-level academic achievement, and multicultural competence for all students” (p. 1).

Specifically, Howard et al., (2007) posit that the guiding principles are applicable to the following models: developmental bilingual programs, two-way immersion, and foreign language immersion programs. Howard et al. (2007) also point out that although the guiding principles target elementary programming, these could also be applicable to the secondary level with a few adaptations according to ones’ setting. Additionally, Howard et al. (2007) note that the *Guiding Principles for Dual Language Education* reflect NCLB requirements relevant to high-stakes testing and standards-driven curriculum.

The *Guiding Principles* are organized into seven strands, reflecting the major dimensions of program planning and implementation (Howard et al., 2007):

- Assessment and Accountability
- Curriculum
- Instruction
- Staff Quality and Professional Development
- Program Structure

- Family and Community
- Support and Resources

Howard et al. (2007) point out that each strand comprises a number of guiding principles followed by key points. Howard et al., (2007), p. 2, add that “These key points further elaborate on the principle, identifying specific elements that can be examined for alignment with the principle.” Howard et al. (2007) explain how key points further elaborate on the pertinent principle as follows: For example, the first principle in the Assessment and Accountability strand addresses the need for an infrastructure to support tracking student performance data over time. Finally, it is important to note that the document was designed to be utilized by dual language programs as a tool for planning, self-reflection, and growth (Howard et al., 2007).

### **Summary**

Collier and Thomas’ scholarly work in the field of dual language education is congruent with a considerable amount of scientifically based and sound research that corroborates that dual language is the most conducive program to promoting high levels of achievement for ELLs. Thomas and Collier (2012) further expound that “Only dual language programs (with long-term academically and cognitively enriched instruction in two languages, one of which is the primary language of the English learners and the second instructional language is English) allow English language learners to score as high as (or higher than) typical native English speakers after 6-8 years, when tested on the English reading test, which tests curricular mastery in all subjects combined” (Thomas & Collier, 2012, p. 94).

Only dual language programs that provide long-term, enriched teaching of all curricular subjects through English learners' primary language as well as acquisition of English as a second language through all curricular subjects completely close the full achievement gap when tested on difficult English norm-referenced tests that show the full-extent of the gap (Thomas & Collier, 2012, p. 94).

Thomas and Collier (2012) cite in the compilation of numerous studies that ELLs participating in dual language programs close the achievement gap.

Given the extant research findings of English language learners' higher academic achievement having participated in well implemented dual language programs, it is of utmost importance to identify the critical elements and best practices that contribute to student success so that these practices can be duplicated and more opportunities for increased student success can be offered to English language learners across the state and the nation. While the document *Guiding Principles for Dual Language Education* may offer a contribution to the advancement of dual language education and can serve as a tool for planning, self-reflection, and growth, there is opportunity for refinement of the *Guiding Principles for Dual Language Education* survey. As previously discussed, the aim is the survey can also serve as a tool to identify areas of strength and areas for improvement so that schools can set goals and enact changes to improve the implementation of the dual language programming and ultimately increment student achievement. When critically examining the utility of the survey and analyzing each principle and its corresponding key points within each strand, it is difficult not only to identify which element is to be measured in the first place, but it is nearly impossible to



measure a discrete element independently at a time. Most key points are replete with layered linked elements within each statement—double, tripled, and sometimes multiple-linked elements. After deconstructing the guiding principles, conducting principal components analysis (PCA), and consolidating the critical elements it is recommended that the survey be restructured and streamlined utilizing a reduced list of critical elements to increase the validity and reliability of the measureable guiding principles for dual language education. Streamlining the survey will further optimize the practicality of its utility and its original intent which is to serve as a tool for self-reflection, planning, and growth. In conjunction to the content wherein the *Guiding Principles for Dual Language Education* document, comprised of an extensive body of research and best practices, streamlining the survey would serve as an additional tool to glean valuable input and feedback from the micro-practitioners in the field to the macro-school districts, state legislatures, national entities, and universities respectively, to aid in the development of programming implementation guidelines. It could further aid in customizing professional development offerings, to informing policy development at the state and federal levels, to bolstering the theoretical foundation of teacher and leadership preparation programs related to the realm of effective dual language education programming.

In closing, despite of the mounting evidence of the research in the field citing the success of dual language immersion programs, current political initiatives, such as English-only and anti-bilingual education legislation further compel educational leaders to ensure that a full-range of data is analyzed and reviewed when evaluating the effectiveness of the program. It is imperative that program evaluation include not just assessment data, but the quality of implementation data relative to the national principles

for dual language education; however, when examining the original national *Guiding Principles for Dual Language Education* paper-and-pencil survey, the statements are comprised of double and triple barrel statements. The latter presents a challenge for practitioners in the field to identify which individual item should be measured in the first place, but, furthermore, it is nearly impossible to measure a discrete element independently at a time. To this end, the purpose of the study is that by disseminating a deconstructed survey stemming from the original national *Guiding Principles for Dual Language Education* survey and conducting principal components analysis (PCA), the results would yield a reduced list of discrete elements that are critical contributors to effective dual language programming that could further aid in evaluating the effectiveness of the program and consequently impacting increased student achievement.

## Chapter III

### Methodology

#### Introduction

After the introduction, this section of the paper discusses the following topics: research design, research procedures, instrumentation, data collection, participants, data analysis, limitations of the study, and summary. Before proceeding to discuss these components, it is fitting to review the extensive body of empirical research that substantiates the high academic achievement of ELLs participating in dual language programs. As noted in Chapter II, numerous researchers have postulated that ELLs participating in well-implemented dual language programs for at least six years score average to above average on norm-referenced standardized tests and criterion-referenced state tests of reading and other subjects in English relative to non-ELLs students in English-only classrooms (Thomas & Collier, 1997, 2002, 2009, & 2012).

Given the extensive research base documenting the academic achievement success of ELLs participating in dual language programs, this study aims to address the following guiding questions:

1. What are the discrete elements stemming from the curriculum strand from the *Guiding Principles for Dual Language Education* deconstructed survey that could further be examined to inform programming decisions?
2. What are the discrete elements stemming from the instruction strand from the *Guiding Principles for Dual Language Education* deconstructed survey that could further be examined to inform implementation decisions?

3. What are the discrete elements stemming from the family and community strand from the *Guiding Principles for Dual Language Education* deconstructed survey that could further be examined to inform implementation decisions?

The purpose of this study is that by disseminating a deconstructed survey stemming from the national *Guiding Principles for Dual Language Education* survey and conducting principal components analysis (PCA), the results would yield a reduced list of discrete elements that are critical contributors to effective dual language programming that could further be examined to inform programming and implementation decisions. The survey for the study is comprised of deconstructed items relevant to three strands: curriculum, instruction, and family and community. The original survey is a paper and pencil survey; however, the survey for study will be disseminated as an online survey. To address the discrete elements that could be utilized to inform programming, the deconstructed items from the curriculum strand are included in the online survey. To address the discrete elements that could inform implementation, the deconstructed items from the instruction and family and community strand are included in the online survey.

### **Research Design**

The research design entails utilizing factor analysis. Factor analysis is not comprised of a singular statistical method, but rather it is a set of statistical techniques or methods utilized to examine the relationships within a group of observed variables as measured by questions or items (Beavers et al., 2013). Before outlining the specific research methodology, it is fitting to note that there are two main approaches to factor analysis: exploratory and confirmatory. Pallant (2016) cites that “Exploratory factor analysis (EFA) is often used in the early stages of research to gather information about

(explore) the interrelationships among a set of variables” (p. 182). Pallant (2016) further notes that “Confirmatory factor analysis [CFA], on the other hand, is a more complex and sophisticated set of techniques used later in the research process to test (confirm) specific hypotheses or theories concerning the structure of underlying a set of variables” (p. 182).

Specifically, this study will utilize principal components analysis (PCA), an independent technique associated with exploratory factor analysis. Principal components analysis is considered a “data reduction” technique (Pallant, 2016). Pallant notes that “It takes a large set of variables and looks for a way the data may be ‘reduced’ or summarized using a smaller set of factors or components. It does this by looking for ‘clumps’ or groups among the intercorrelations of set of variables” (p. 182-183). Pallant further adds that “In principal analysis the original variables are transformed into a smaller set of linear combinations, with all of the variance in the variables being used” (p. 182-183).

Pallant (2016) identifies three main steps for conducting principal components analysis: Step 1: Assessment of the sustainability of the data for factor analysis; Step 2: Factor Extraction; and Step 3: Factor Rotation and Interpretation. Pallant further explains that step 1 involves determining whether a particular data set is suitable for factor analysis: sample size and the strength of the relationship among the variables (items). As mentioned earlier, one of the first steps involves verifying that the data is suitable for factor analysis. This involves reviewing several criteria. One of the criteria is to review the correlation matrix for the presence of coefficients of .3 and above. Next, the researcher would review the Kaiser-Meyer-Olkin Measure of Sampling Adequacy

(KMO) to determine that the value is .6 or above (Pallant, 2016). Also, one would need to verify that the Bartlett's Test of Sphericity value is significant (i.e. the Sig. value should be .05 or smaller) (Pallant, 2016).

For step 2, factor extraction involves determining the smallest number of factors that can be used to best represent the interrelationships among a set of variables. When deciding the number of factors to retain, Pallant (2016) recommends utilizing the following: Kaiser's criterion; scree test; and parallel analysis. In reference to the Kaiser's criterion, Pallant (2016), p. 185, recommends the following:

Kaiser's criterion- It is one of the most commonly used techniques, also known as the eigenvalue rule. Using this rule, only factors with an eigenvalue of 1.0 or more are retained for further investigation. The eigenvalue of a factor represents the amount of total variance explained by the factor.

As for the Scree test, Pallant (2016), p. 185, cites the following information:

Scree test- Another approach that can be used is Cattell's scree test (Cattell, 1966). This involves plotting each of the eigenvalues of the factors and inspecting the plot to find a point at which the shape of the curve changes direction and becomes horizontal. The recommendation is retaining all factors above the elbow, or break in the plot, as these factors contribute the most to the explanation of the variance in the data set.

In reference to the Parallel analysis, Pallant (2016), p. 185, recommends the following:

Parallel analysis- Another technique is Horn's parallel analysis (Horn 1965). Parallel analysis involves comparing the size of the eigenvalues with those obtained from a randomly generated data set of the same size. Only those

eigenvalues that exceed the corresponding values of from the random data set are retained. This approach to identifying the correct number of components to retain has been shown to be the most accurate, with both Kaiser's criterion and Cattell's scree test tending to overestimate the number of components (Hubbard & Allen, 1987; Zwick & Velicer, 1986).

The last step involves factor rotation and interpretation. According to Pallant (2016) once the number of factors has been determined, the next step is to strive to interpret them. Factors are 'rotated' and present a pattern of loadings and the variables are 'clump together' (Pallant, 2016). Pallant presents that there are two main approaches to rotation, resulting in orthogonal (uncorrelated) and oblique (correlated) factor solutions. Pallant cites that there are different techniques within the rotational approaches as follows: orthogonal: Varimax, Quartimax, Equamax; oblique: Direct Oblimin, Promax. Pallant recommends that the researcher begin with an oblique rotation to check the degree of correlation between the factors. Pallant further adds that the researcher is seeking to find what Thurstone in 1947 refers to as "simple structure." Pallant notes that "This involves each of the variables loading strongly on only one component, and each component being represented by a number of strongly loading variables" (p. 185). Finally, Pallant (2016) contends that this will help one to interpret the nature of the factors by checking the variables that load strongly on each of them.

**Sample size.** Since sample size is a contentious topic that has generated much discussion among scholars over the last decades, it will be discussed in this section. Generally, there are two main camps of thought in the literature: those arguing for a minimum number of cases and those advocating for subjects-to-variables ratio (STV).

Beavers et al. (2013), p. 2 cite that selected criterion suggests the sample size should have the following: 51 more cases than the number of variables (Lawley & Maxwell, 1971); at least 10 cases per each item, and the subjects-to-variables [STV] ratio should be no lower than 5 (Bryant & Yarnold, 1995); at least 100 cases and a STV ratio of no less than 5 (Suhr, 2006); at least 150 - 300 cases (Hutcheson & Sofroniou, 1999); at least 200 cases, regardless of STV (Gorsuch, 1983); and at least 300 cases (Norušis, 2005).

While criteria provided for determining the sufficiency of a sample for factor analysis procedures vary greatly and include a plethora of differing criteria, Beavers et al. (2013), p. 2, cite that “There is, however, general agreement that an inadequate sample size can be detrimental to the factor analytic process and produce unreliable, and therefore, non-valid results” (Osborne & Costello, 2004).

**Strength among factors.** Yet, the controversy over sample size continues to be examined in the field and a different criterion is reexamined. Beavers et al. (2013) postulate that critics are suggesting that ratio criteria do not provide an accurate guide, citing the following critics: Guadagnoli and Velicer (1988), Hogarty, Hines, Kromrey, Ferron and Hong (2001), Osborne and Costello (2004), and Zhao (2009). Additionally, Beavers et al. (2013) comment that “Guadagnoli and Velicer (1998) suggest, what has been largely confirmed in the literature, that the needed sample size is conditional upon the strength of the factors and items” (p. 2-3). Beavers et al. (2013), p .3, further expound the following:

If the factors have four or more items with loadings of .60 or higher, then the size of the sample is not relevant. If the factors have 10 to 12 items that load moderately (.40 or higher), then a sample size of 150 or more is needed to be



confident in the results. Finally, if factors are defined with few variables and have moderate to low loadings, a sample size of at least 300 is needed. (p. 3)

Beavers et al. (2013) comment that “Fabrigar et al. (1999) and MacCullum et al. (2001), further support that stable solutions can be reached with samples as low as 100 when three to four strong items (loading of .70 or greater) comprise a factor, suggesting that weaker relationships need a larger sample size” (p. 3).

### **Research Procedures**

Part of the research procedures involves verifying if the data meets the assumptions required for multivariate statistical techniques. Before providing additional details regarding meeting the assumptions, it is fitting to describe the source of the data. The data will be exported to an Excel spreadsheet after the online survey has been administered via Qualtrics, an online platform. Once the sample data has been compiled, Pallant (2016), p. 187-188, propounds that the data used must satisfy the assumptions required of multivariate statistical techniques, including the following:

1. Sample size. Ideally, the overall sample size should be 150+ and there should be a ratio of at least five cases for each of the variables.
2. Factorability of the correlation matrix. To be considered suitable for factor analysis, the correlation matrix should show at least some correlations of  $r = .3$  or greater. Bartlett’s Test of Sphericity should be statistically significant at  $p < .05$  and the Kaiser-Meyer-Olkin value should be .06 or above. These values are presented as part of the output from factor analysis.
3. Linearity. Because factor analysis is based on correlation, it is assumed that relationship between the variables is linear. Pallant (2016) cites that Tabachnick

and Fidell (2013) suggest a ‘spot check’ of some combinations of variables.

Unless there is clear evidence of a curvilinear relationship, you are probably sage to proceed provided that one has an adequate sample size and ratio of cases to variables.

4. Outliers among cases. Factor analysis can be sensitive to outliers. Therefore, as part of one’s initial data screening process, it is recommended to check for these and either remove or recode to a less extreme value. (Pallant, 2016, p. 187-188)

Pallant (2016) cites that “The second issue to be examined in step 1 is the strength of the intercorrelations among the items” (p. 184). Pallant recommends the use of two statistical measures for assessing the factorability of the data: Bartlett’s test of sphericity (Bartlett 1954), and Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (Kaiser 1970, 1974). Pallant (2016), p.184, provides the following guidance regarding these tests:

Bartlett’s test of sphericity should be significant ( $p < .05$ ) for the factor analysis to be considered appropriate. The KMO index ranges from 0 to 1, with .6 suggested minimum value for a good factor analysis (Tabachnick & Fidell, 2013).

### **Instrumentation**

Part of the instrumentation involves deconstructing the questions items found in the original *Guiding Principles for Dual Language Education* paper-and-pencil survey prior to disseminating the revised instrument, the online survey. It is fitting to describe the contents of the survey and provide an explanation of the deconstruction process. The original survey is comprised of seven strands as follows: Strand 1: Assessment and Accountability; Strand 2: Curriculum; Strand 3: Instruction; Strand 4: Staff Quality and

Professional Development; Strand 5: Program Structure; Strand 6: Family and Community; and Strand 7: Support and Resources. Each strand is composed of an average of 3-5 principles and 3-5 key points under each principle. The key points further elaborate on a particular principle, identifying specific elements that can be examined for alignment within the principle utilizing four possible levels of alignment: minimal alignment, partial alignment, full alignment, and exemplary practice. Table 1 Guiding Principles of Dual Language Education Survey Deconstruction Summary shows a list of original and deconstructed principles and key points per strand. Table 1 outlines each strand, its corresponding principles and key points. Column A and B indicate the total number of principles and key points found in the original survey. Columns C and D indicate the total number of principles and individual elements after deconstructing each statement. In analyzing the data outlined in Table 1, the original survey contains 30 principles (column A) and 103 key points (column B). The survey requires stakeholders to examine each key point and rate one's school's current level of alignment utilizing four possible levels: minimal alignment, partial alignment, full alignment, and exemplary practice.

Table 1

*Guiding Principles of Dual Language Education Instrument Deconstruction Summary*

Strand	A-Principles (Original Survey)	B- Key Points (Original Survey)	C- Principles (Deconstructed Survey)	D- Key Points (Deconstructed Survey- Discrete Elements)
1 Assessment and Accountability	6	20	18	57
2 Curriculum*	3	11	7	24
3 Instruction*	4	18	9	37
4 Staff Quality and Professional Development	4	15	6	24
5 Program Structure	5	16	16	34
6 Family and Community*	3	10	11	21
7 Support and Resources	5	13	9	48
Total	30	103	76	245

\*The following 3 strands are part of the online survey: 2: Curriculum (24); 3: Instruction (37); and 6: Family and Community (21).

When examining each principle and its corresponding key points within each strand, it is difficult to nearly impossible to measure an individual element independently at a time. Most key points are replete with layered linked elements within each

statement—double, tripled, and sometimes multiple-linked elements. Since the survey is asking participants to rate one’s school’s current level of alignment to each key point, the focus of deconstructing the statements will be placed on the key points. After deconstructing each key point statement, individual elements were identified within each key point. Hence, since the original key point statements are replete with layered linked elements within each statement—double, tripled, and sometimes multiple-linked elements, it presents a predicament not only in identifying which element is to be measured in the first place, but also in measuring an individual element independently at a time. One implication for practitioners to cogitate when considering using a prospective survey for the purposes of monitoring or evaluating the program is to examine the instrument critically by reviewing the construction of the questions being asked to the respondents. It is recommended that questions be clear to the respondents as well as answerable (Newcomer & Triplett, 2010). For example, in reference to surveys, it is recommended that the questions be as short and clear as possible focusing on a single issue or item and avoid double-barreled questions (Adam, 2010). To this end, the deconstruction process entails examining each key point and isolating each discrete element within each key point to facilitate measuring one item at a time. Below is an example of the deconstruction process. Particularly, it is an example relevant to the deconstruction of key points A and B under Principle 1, Strand 1.

***Strand 1: Assessment and Accountability***

***Principle 1: The program creates and maintains an infrastructure that supports an accountability process.***

**Key Point A-** *The program has developed a data management system for tracking student data over time. (This statement was deconstructed to include two statements as outlined below.)*

- 1.1A.1 The program has developed a data management system
- 1.1A.2 The program has developed a data management system for tracking student data over time

**Key Point B-** *Assessment and accountability action plans are developed and integrated into program and curriculum planning and professional development. (This is the original statement which was deconstructed into eight individual elements to facilitate identifying which discrete element could be measured as outlined below.)*

- 1.1B.1 Assessment action plan is developed
- 1.1B.2 Assessment action plan is integrated into program
- 1.1B.3 Assessment action plan is integrated into curriculum planning
- 1.1B.4 Assessment action plan is integrated into professional development
- 1.1B.5 Accountability action plan is developed
- 1.1B.6 Accountability action plan is integrated into program
- 1.1B.7 Accountability action plan is integrated into curriculum planning
- 1.1B.8 Accountability action plan is integrated into professional development

In this particular case, after deconstructing the key point B statement, 8 specific elements were identified within key point B. After following the same process and deconstructing each key point, out of the original 103 key points outlined in the original survey, 245 discrete elements (column D) were identified in the survey. For a detailed breakdown of the deconstruction, refer to Table 1. Once the data is collected and statistical tests are

applied, the aim is to arrive at a reduced number of elements that are critical contributors to effective program implementation and could potentially be actually measured to inform programming and implementation decisions. Table 2 Strand 2 Curriculum Sample Deconstruction shows a sample of the deconstruction for principle 2 and the key point A and B. Key point A was deconstructed into 4 discrete elements and key point B was deconstructed into key points.

Table 2

*Strand 2 Curriculum Sample Deconstruction*

Part 1

Principle 2: The program has a process for developing and revising a high quality curriculum.

2.2.1 The program has a process for developing a high quality curriculum.

2.2.2 The program has a process for revising a high quality curriculum.

Part 2

Key Point: A: There is a curriculum development and implementation plan that is connected to state and local standards. (2.2A)

2.2A.1 There is a curriculum development that is connected to state standards.

2.2A.2 There is a curriculum development that is connected to local standards.

2.2A.3 There is an implementation plan that is connected to state standards.

2.2A.4 There is an implementation plan that is connected to local standards.

Key Point B: The curriculum is based on general education research and research on language learners. (2.2B)

2.2B.1 The curriculum is based on general education research.

2.2B.2 The curriculum is based on research on language learners.

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Part 1 shows the deconstruction for Principle 2.

Part 2 shows the deconstruction for Key Point A and B respectively. Key Point A was deconstructed into 4 discrete elements. Key Point B was deconstructed into 2 discrete elements.

*Note.* Since the questions contained in the online survey are deconstructed items stemming from the original Guiding Principles for Dual Language Education instrument, some of the question stems may be repeated.

The online survey that will be disseminated to schools will contain only three strands out of the original seven strands. After having deconstructed each key point, 245 discrete elements were deduced. Yet, the online survey has been streamlined to contain only 82 items. Additionally, since a large portion of the target audience for the online survey will be teachers, the online survey will include the strands that teachers have most direct involvement in the areas of programming and implementation of the dual language program, that is, curriculum; instruction; and family and community. For the curriculum strand, after deconstructing each key point, a total of 24 discrete elements were derived out of the original 11 key points. For the instruction strand, after deconstructing each key point, a total of 37 discrete items were derived out of the original 18 key points. In reference to the family and community strand, after deconstructing each key point, a total of 21 discrete elements were derived out of the original 10 key points; therefore, the online survey will be comprised of 82 discrete elements.

The null hypothesis is that there would be no change and that all 82 discrete elements included in the online survey would emerge from utilizing principal components analysis, a technique associated with exploratory factor analysis. The alternative hypothesis is that there would be a change and that a reduced number of discrete elements would emerge from statistical clustering analysis. Specifically, principal components analysis will be conducted to determine the necessity of all 82 discrete elements versus a reduced number by approximately less than one half, resulting in less than 40 individual, discrete elements that could serve as critical contributors to effective dual language programming to inform programming and implementation decisions.



## Data Collection

To collect the data, the *Guiding Principles for Dual Language Education* online survey was disseminated to schools in the study district that are offering the dual language 80:20 and 50:50 model, one-way and two-way immersion. The survey was distributed to 28 schools. To preserve the anonymity of each school, potential subjects were not be asked to identify their school by name; therefore, schools were not identified in the survey by name.

It is fitting to describe the potential number of subjects to participate in the online survey. For each school, an average of two administrators could potentially participate, that would be the principal and assistant principal. Some schools may have one additional administrative or support staff, such as a dual language coordinator, instructional coordinator, or teacher specialist that could also potentially participate in the survey.

Teachers are also part of the target audience. Generally, on average, each school is offering at least two classes per grade level beginning in kindergarten through fifth grade for a total of two teachers per grade level. In addition to two administrators per school and classroom teachers, schools have an average of four specials or ancillary teachers. Additionally, teacher development specialists (TDS) are potential subjects. Teacher development specialists serve as coaches district-wide in dual language campuses. As of 2016-17, there are a total of 16 teacher development specialists.

Based on the type of model 80:20 or 50:50 and grade levels being offered, the potential number of teachers participating could be determined for each school. Generally, on an average each school is offering at least two classes per grade level

beginning in kindergarten through fifth grade for a total of two teachers per grade level. In an 80:20 model, it is fitting to note that most of these are being taught by a self-contained teacher. If this is the case, then an average of two teachers per grade level have a potential of participating. For example, in an 80:20 school that has offers the program K-5 for a span of six grades, the average potential teachers for that school would be an average of two teachers per grade level times the span of six grades equal 12 times the number of schools offering the program which in this case is one then total would equal to 12. If two schools were offering the 80:20 model in K-5, then the average would be 24 potential teachers that would be participating.

In a 50:50 class, most of those classes are taught by a team of two teachers, one bilingual and one ESL certified. In those cases, two teachers would be participating for every two classrooms for a total of four teachers per grade level. For example, in a 50:50 school offering the program in K-5 for a span of six grades, the average potential teachers for that school would be an average of four per grade level times the span of six grades equal 24 times the number of schools offering the program. In this case, there would be a total of 24 teachers participating. If two schools were offering the 50:50 model in K-5, then the average would be 48 potential teachers that would be participating.

In sum, the criteria utilized to determine the potential subjects that could participate in the online survey was based on an average of the staff members per school as follows:

- Two Administrators per school, that is, one principal and one assistant principal

- One support staff member per school, that is, a coordinator or teacher specialist
- Two or four teachers (assigned to a dual language homeroom), that is, per grade level per school depending on whether the school is offering an 80:20 or a 50:50 model respectively.
- Four ancillary or specials teachers per school

Besides taking the average staff members per school into account, for the determining the potential number of homeroom teachers, that is, teachers teaching the dual language program for the entire day of instruction (not ancillary), the type of model 80:20 or 50:50 as well as the current span of grade levels offering the program was taken into account. Based on the criteria listed above the potential number of subjects—ranging from administrators, to dual language homeroom teachers, to ancillary teachers, to support staff—was determined for each school and consequently for each cohort of schools. The cohort of schools is organized by the established date of the program began. Cohort 1 was establishment dates range from 1994-95 to 2008-09. Cohort 2 establishment date is 2012-13 and Cohort 3 is 2014-15. Table 3 Dual Language Programming Estimated Potential Subjects shows the estimated potential number of subjects per school per cohort. The potential number of subjects per cohort was calculated as follows: Cohort 1=229; Cohort 2=99; and Cohort 3=280. If 100% of the potential subjects were to participate, the total would be 608. If one third of the potential subjects were to participate, then the total would be 199 potential participants. The goal is to have at least 150 potential subjects participate in the survey.

Table 3

*Dual Language Programming Estimated Potential Subjects by Cohort 1, 2, and 3*

Cohort Establishment Date(s)	School Descriptors				Potential Participants					Total
	Model	School Level	Grade Levels /Span	Number of Schools	Administrators (1 Principal + 1 Assistant Principal) Avg.=2	Support Staff (1 Coordinator or 1 Teacher Specialist) Avg.=1	Teachers * (Homeroom) Avg.= 2 or 4	Ancillary Teachers (Specials) Avg.=4		
Cohort 1 1994-95 to 2008-09	1 MG	PK-8	10	1	2	1	20	4		
	80:20:00	1 Elem.	PK-5	7	1	2	14	4		
		4 Elem.	K-5	6	4	8	48	16		
	50:50:00	3 Elem.	PK-5	7	3	6	84	12		
<b>Subtotal</b>				<b>9</b>	<b>18</b>	<b>9</b>	<b>166</b>	<b>36</b>	<b>229</b>	
Cohort 2 2012-13	80:20:00	1 Elem.	PK-4	6	1	2	12	4		
		2 Elem.	K-2	3	2	4	12	8		
	50:50:00	1 Elem.	PK-4	6	1	2	24	4		
		1 MG	K-3	4	1	2	16	4		
<b>Subtotal</b>				<b>5</b>	<b>10</b>	<b>5</b>	<b>64</b>	<b>20</b>	<b>99</b>	
Cohort 3 2014-15	80:20:00	1 Elem.	PK-2	4	1	2	8	4		
		1 Elem.	K-2	3	1	2	6	4		
	50:50:00	6 Elem.	PK-2	4	6	12	96	24		
		6 Elem.	K-2	3	6	12	72	24		
<b>Subtotal</b>				<b>14</b>	<b>28</b>	<b>14</b>	<b>182</b>	<b>56</b>	<b>280</b>	
<b>Total</b>				<b>28</b>					<b>608</b>	

\*80:20- Self-Contained = Avg.= 2 per grade level

50:50- Teaming = 2 per every two classrooms = Avg. 4 per grade level

MG=Multigrade =PK/K-8  
Elem. =Elementary PK/K-5

Participants will be asked to read 82 key points and select one progress indicator per key point—not observed, minimal, partial, full, and exemplary—that illustrates the school’s alignment to the national principles. The survey may take approximately 20 minutes. The survey will be administered online using Qualtrics, a digital platform. As part of the online survey, a link to the *Consent to Take Part in a Human Research Study* cover letter will be provided to potential subjects. A checkbox will be included for the subject to click “I have read the consent information and agree to take part in the research” prior to moving forward to the study instrument(s). The results of the survey will be compiled and tabulated via an excel spreadsheet that can exported as a data set from Qualtrics to be used to conduct principal components analysis using the International Business Machines (IBM) Statistical Package for the Social Sciences (SPSS) software.

The survey also includes a demographic section. The demographic data will be used for the purposes of categorizing the data, not to personally identify potential subjects or schools. Part of the demographic section will collect the following information: length of school offering the program; model offering 80:20 or 50:50; and most offered modality one-way or two-way. The survey also includes questions about one’s gender, ethnicity, and program designations. Among the additional information that will be collected is one’s position or role. If one’s role is other than teacher, then the following information was asked: length of in role and length of years supporting the implementation of the dual language program. If one’s role is teacher, then the following information was also asked: length of teaching experience; length of teaching dual language students; and grade level(s) taught. Additionally, if one’s role is teacher of

record of dual language homeroom (not ancillary), then the following information was asked: one's certification and one's classroom teaching setting either- self-contained teaching both English and Spanish, teaming teaching English only, teaming Spanish only.

### **Participants**

Because this study stems from utilizing the results of the *Guiding Principles for Dual Language Education* survey, it is fitting to use cluster sampling, a naturally occurring group, of current staff members that support the implementation dual language program or teach dual language students dual language (i.e. principals, assistant principals, teachers (assigned to dual language homeroom), ancillary teachers, coordinators, and teacher specialists) at schools currently implementing the dual language program. Teachers are defined as the one assigned to a dual language homeroom, teaching dual language students for the entire instructional day in a self-contained or teaming setting. Ancillary teachers teach dual language students part of the time via art, physical education, and music. Additionally, teacher development specialists (TDS), dual language coaches, and multilingual programs department (MPD) Specialists, dual language programming specialists, were asked to participate in taking the online survey.

Furthermore, the sample is characterized as a volunteer sample, or convenient sample. Volunteer samples “are based on individual’s expression of willingness to participate in the research study rather than on systematic sampling strategies” (Gall, Gall, & Borg, 2015, p. 115). Because the sample is characterized by the current the study district’s employees (dual language teachers, principals, assistant principals, coordinators, teacher specialists, and teacher development specialists (TDS), implementing the dual language program, the age group ranges from 21 year olds to 65.

Vulnerable subjects protected under the HHS at 45 CFR 46.111(b) (Protection of Human Subjects 2009) and the U.S. Food and Drug Administration (FDA) at 21 CFR 56.111(b) (Institutional Review Boards, 2015) as follows is excluded from the study: children, prisoners, pregnant women, handicapped, mentally disabled persons, and economically or educationally disadvantaged persons. Because the sample is characterized by cluster sampling, a natural occurring group, of current the study district employees (dual language teachers, principals, assistant principals, coordinators, teacher specialists, and teacher development specialists (TDS), implementing the dual language program, the potential subjects have inherently been screened by the school district to work as employees for the study district.

It is fitting to describe briefly the potential dual language sample based on the type of program being offered at a particular school. The schools that are prospective participants are offering either an 80:20 or 50:50 model as well as a one way and two-way immersion program. The dual language program design is characterized by two main features. One is the language distribution and the other is the demographics of the class. In reference to the language distribution, dual language programming can offer two models either, the 90:10 or 50:50. The study district offers two program models. One is the 80:20 model, originally coined as a 90:10, and the other is the 50:50. In the 80:20 model, the language distribution is 80% in the partner language and 20% in English. Specifically, in an 80:20, students are immersed in the partner language for 80% of the time, in this case Spanish, and 20% in English beginning in Kindergarten. The percentage of Spanish and English fluctuate as follows: 70:30 in first grade, 60:40 in second grade, and 50:50 in third through fifth grade. In the 50:50 model, students receive

instruction half of the day in the partner language, in this case Spanish, and the other half of time in English in Kindergarten through fifth grade. Most programs begin in Kindergarten and that cohort moves to first grade and so forth. Some schools begin the program in Pre-Kindergarten.

Based on the demographics of the classroom, the study district offers the one-way and the two-way classroom setting. The one-way is comprised of one language group, English language learners whose first language is Spanish. Students in a one-way, are taught the full curriculum via the heritage or partner language, in this case Spanish, as well as in English. The two-way is comprised of two language groups, English language learners, whose first language is Spanish, as well as non-ELLs, whose first language is English. In the two-way classroom, both language groups are learning the partner language, in this case Spanish, as well as English. It is fitting to note that demographics and the language of instruction are independent features of each other and can coexist with any one combination. Both the 80:20 and the 50:50, regardless of the language distribution model, can be offered in a classroom setting of either one-way or two-way. Therefore, the study district has 80:20 models that are being implemented via a one-way classroom setting as well as a two-way. It also has 50:50 models that are offering the program via a one-way or a two-way classroom setting.

As of the 2016-17 school year, in the study district 62 schools are offering dual language programming. The dual language schools are divided in five cohorts of schools. The Cohort 1 began the first school as early as 1994 with the last school beginning in 2008. As of the 2016-17 school year, these schools have offered the program for 23 years. The first cohort is comprised of eight elementary schools and one



PK-8 campus for a total of nine schools. The Cohort 2 began to offer the program in 2012. As of the 2016-17 school year, these schools would have offered the program for nine years. The second cohort of schools is comprised of four elementary schools and 1 K-8 campus for a total of 5 schools. It is important to note that the schools that began the program in 2012 have restructured the program. Therefore, although the schools that began the program in 2012 would have five years of implementation, the grade level offerings vary. Hence, in reference to Cohort 1 and 2, the program is being offered in 12 elementary schools and 2 PK/K-8 campuses for a total of 14 schools. These 14 schools will be invited to participate in the study. While three secondary campuses (two middle schools and one high school) are part of the Cohort 1, these will not be included in the study. The early models were coined as 90:10, two-way classrooms. The first programming offering began in 1994. Those 90:10 models are now referred to as 80:20 in the study district with the onset of dual language expansion that began in 2014.

In 2014-15, Cohort 3 began by offering the 50:50 model in fourteen elementary campuses. In 2015-16, Cohort 4 was started by 24 campuses offering the 50:50 program model. In 2016-17, Cohort 5 was started by three elementary campuses adding the program and one middle school. Although 62 schools are currently offering the program, the three specialty schools will not be included in the study; therefore, out of the 59 campuses offering the program, the survey will be administered to elementary campuses that have been implementing the program for a minimum of at least two years. Therefore, the survey will be administered to schools in Cohort 1-3 for a total of 28 elementary campuses.

## **Data Analysis**

Before describing the data analysis procedures, it would be fitting to describe the components of the online survey as well as the demographic section. Since the original survey is lengthy, after having deconstructed each key point, it contains 245 discrete elements; the online survey has been streamlined to contain only 82 items. Additionally, since a large portion of the target audience for the online survey will be teachers, the online survey will include the strands that teachers have most direct involvement in the areas of programming and implementation of the dual language program, that is, curriculum; instruction; and family and community. For the curriculum strand, after deconstructing each key point, a total of 24 discrete elements were derived out of the original 11 key points. For the instruction strand, after deconstructing each key point, a total of 37 discrete items were derived out of the original 18 key points. In reference to the family and community strand, after deconstructing each key point, a total of 21 discrete elements were derived out of the original 10 key points. Therefore, the online survey is comprised of 82 discrete elements.

In addition to the 82 discrete items, the survey also includes 15 demographic questions. Seven questions are applicable to all subjects including personnel whose role is other than teacher, such as the principal, assistant principal, dual language coordinator, teacher specialist, teacher development specialists (TDS), and multilingual programs specialists. Subjects other than teacher have 9 questions total that applicable to them and teachers have 13 questions. For the questions involving a response indicating a number of years, a span of years is provided as follows: Less than 3 years; 3 to 5 years; 5 to 10 years; 10-15 years; More than 15 years; and Other, please specify. The general

questions that apply to all subjects are as follows: length of years school has been offering the program; type of model 80:20 or 50:50; modality most offered -one-way or two-way; gender; ethnicity; and designations that best describe the school, such as Elementary School PK/K-5; PK/K-8 School; Early Childhood Center (ECC); Vanguard Neighborhood; International Baccalaureate (IB); Magnet; Title I; International Spanish Academy (ISA); and Other, please specify. For subjects whose role is other than teacher, they also have two other questions to respond to specifying the number of years they have in that role as well as how long have they been supporting the implementation of the dual language programming at the current school. The teachers are asked the following questions: the length of years teaching; the length of years teaching dual language students; and the grade level one is teaching. For the teacher of record for a dual language homeroom (not ancillary) three additional questions are asked. One is relevant to one's certification, the other is relevant to one's teaching setting most of the time—self-contained (both English and Spanish), teaming English only, or teaming Spanish only. The last one is relevant to which best describes the classroom composition one is teaching most of the time either one-way or two-way.

After performing the principal components analysis tests via the International Business Machines (IBM) Statistical Package for the Social Sciences (SPSS) software, the data analysis is comprised of several steps involving analyzing the output data generated by SPSS. One of the first steps involves verifying that the data is suitable for factor analysis. This involves reviewing several criteria. One of the criteria is to review the correlation matrix for the presence of coefficients of .3 and above. Next, the researcher would review the Kaiser-Meyer-Olkin Measure of Sampling Adequacy

(KMO) to determine that the value is .6 or above (Pallant, 2016). Also, one would need to verify that the Bartlett's Test of Sphericity value is significant (i.e. the Sig. value should be .05 or smaller) (Pallant, 2016). The second step would involve determining how many components (factors) to "extract". To complete this step using the Kaiser's criterion, one would examine the components that have an eigenvalue of one or more (Pallant, 2016). According to Pallant (2016), to determine how many components meet this criterion, one would need to examine the Total Variance Explained table. One would examine the first set of columns, labeled Initial Eigenvalues for the components recording eigenvalues of above one. The Cumulative % column would help to explain percent of variance.

After assessing the suitability of the data for factor analysis, the next step involves rotating the factors or items and interpreting the data. Pallant (2016) explains that "There are two main approaches to rotation, resulting in either orthogonal (uncorrelated) or oblique (correlated) factor solutions" (p.186). According to Thompson (2004), "The most common orthogonal rotation method, and indeed the most common rotation of any kind, is the varimax rotation method developed by Kaiser (1958)" (p. 42). Thompson (2004) further adds "In my experience, in about 85% of exploratory factor analysis varimax will yield a simple structure" (p. 42). The purpose of rotating the factors is to generate a pattern of loadings that facilitates easier interpretation (Pallant, 2016). Rotating the factors basically "clumps together" the variables (Pallant, 2016). In this case, the researcher would then use statistical information, such as the weight of factor loadings of .5 and above and one's understanding of the content of the variables and

underlying theory and past research for the purposes of interpreting the data (Pallant, 2016).

The data analysis of the demographic section will be disaggregated to describe the subjects as well as type of schools that participated in the survey. Initially, the data will be disaggregated to determine the total number of subjects that participated in the survey, their gender and their ethnicity. Next, the data will be disaggregated to determine the type of school model being offered 80:20 or 50:50; modality most offered—one-way or two-way; length of years school has been offering the program. Then, the data will be disaggregated to determine the role of the participants, that is, other than teacher and teacher. The number of years in one's role will also be included as well as one's number of years either supporting the implementation of the dual language program or teaching dual language students. The teacher data for the teacher of record for a dual language homeroom (not ancillary) will be disaggregated to determine one's certification- bilingual or ESL; one's teaching setting most of the time self-contained (both English and Spanish); and which term best describes the classroom composition one is teaching most of the time- one-way or two-way.

### **Limitations of the Study**

The study has some limitations. One limitation relates to the principal components analysis (PCA) technique in that it entails conducting several tests by administering the survey several times to different groups of randomly selected subjects each time. Yet, this study involves administering the survey one time to a group to a volunteer or convenient sample. Per Tabachnick and Fidell (2013), the researcher begins

with a very large number of items administering the items to randomly selected subjects.

Tabachnick and Fidell (2013, posit the following:

As a result of the first factor analysis, items are added and deleted, a second test is devised, and that test is given to another randomly selected group.

The process continues until the researcher has a test with numerous items forming several factors that represent the area to be measured. (p. 612)

Tabachnick and Fidell (2013) further reiterate that

The specific goals for PCA and FA [factor analysis] are to summarize patterns of correlations among observed variables, to reduce a large number of observed variables to a smaller number of factors, to provide an operational definition (a regression equation) for an underlying process by using observed variables, or to test a theory about the nature of underlying processes. Some or all of these goals may be the focus of a particular research. (pp. 612-613)

Another limitation is that although 245 total items were derived as a result of deconstructing the 103 key points found in the original survey, only 82 items are part of the online survey. The online survey is comprised of three strands: (2) curriculum; (3) instruction; and (6) family and community. While the goal of study is to conduct principal components analysis to arrive at a reduced list of discrete elements that could contribute to successful student outcomes in dual language programming, PCA would need to be conducted utilizing the remaining 162 items for the online survey to reach its maximum potential of measuring all the items. The latter 162 items were derived after deconstructing the other key points belonging to other strands as follows: (1) assessment and accountability; (4) staff quality and professional development; (5) program structure;

and (7) support and resources. Additionally, as previously explained, PCA involves conducting several tests by administering the survey several times to randomly selected subjects each time. Therefore, the deconstructed items under each strand would need to undergo several tests before narrowing the list to a reduced number of discrete elements per strand.

### **Summary**

Given the extant research findings of English language learners' higher academic achievement having participated in well implemented dual language programs, it is of utmost importance to identify the critical elements and best practices that contribute to student success so that these practices can be duplicated and more opportunities for increased student success can be offered to English language learners across the state and the nation. While the document *Guiding Principles for Dual Language Education* may offer a contribution to the advancement of dual language education and can serve as a tool for planning, self-reflection, and growth, there is opportunity for refinement of the *Guiding Principles for Dual Language Education* survey. The aim is that the survey can also serve as a tool to identify areas of strength and areas for improvement so that schools can set goals and enact changes to improve the implementation of the dual language programming and ultimately increment student achievement.

After deconstructing the guiding principles, conducting principal components analysis (PCA), and consolidating the critical elements it is recommended that the survey be restructured and streamlined utilizing a reduced list of critical elements to increase the validity and reliability of the measurable guiding principles for dual language education. Streamlining the survey will further optimize the practicality of its utility and its original

intent which is to serve as a tool for self-reflection, planning, and growth. In conjunction to the content wherein the *Guiding Principles for Dual Language Education* document, comprised of an extensive body of research and best practices, streamlining the survey would serve as an additional tool to glean valuable input and feedback from the micro (practitioners in the field) to the macro (school districts, state legislatures, national entities, and universities respectively). Identifying the discrete elements that contribute to successful student outcomes could aid educational leaders in the development of programming implementation guidelines as well as the customization of professional development offerings. It could assist in informing policy development at the state and federal levels as well as bolstering the theoretical foundation of teacher and leadership preparation programs related to the realm of effective dual language education programming.



## Chapter IV

### Results

#### Introduction

Chapter IV presents an introduction, a section addressing instrumentation, a description of the participants of the online survey, a data analysis section followed by the results within the context of each question ending with a summary. As part of the results section, examples are presented for particular components from each of the strands—curriculum, instruction, and family and community—to illustrate how specific factors within a component were reviewed and synthesized to deduce a discrete consolidated element for a particular component. The discrete consolidated elements identified by strand could further be examined or measured in a streamline version of the original *Guiding Principles for Dual Language Education* survey to further inform programming and/or implementation decisions. As part of the results, the null and alternative hypothesis are revisited and discussed in the summary section.

Before proceeding with the topics of discussion for this chapter, it is fitting to review the questions that frame the study. The three questions that frame the study are as follows:

1. What are the discrete elements stemming from the curriculum strand from the *Guiding Principles for Dual Language Education* deconstructed survey that could further be examined to inform programming decisions?
2. What are the discrete elements stemming from the instruction strand from the *Guiding Principles for Dual Language Education* deconstructed survey that could further be examined to inform implementation decisions?

3. What are the discrete elements stemming from the family and community strand from the *Guiding Principles for Dual Language Education* deconstructed survey that could further be examined to inform implementation decisions?

### **Instrumentation**

As has been previously discussed, the online survey contains 82 items stemming from three strands—curriculum, instruction, and family and community. For the curriculum strand, after deconstructing each key point, a total of 24 discrete elements were derived out of the original 11 key points. For the instruction strand, after deconstructing each key point, a total of 37 discrete items were derived out of the original 18 key points. In reference to the family and community strand, after deconstructing each key point, a total of 21 discrete elements were derived out of the original 10 key points. Therefore, the online survey is comprised of 82 discrete elements. Participants were asked to select one progress indicator per discrete element- not observed; minimal; partial; full; and exemplary- that best illustrates the school's alignment to the national principles. The estimated time for the survey is approximately 20 minutes. The survey was administered online using Qualtrics, a digital platform.

The online survey also contains a demographic section. The demographic section was designed to aid in identifying the number of participants and describing the participants, type of model, and school program designations. Part of the data that was collected is as follows: length of school offering the program; model offering 80:20 or 50:50; and most offered modality one-way or two-way. The survey also included questions about one's gender, ethnicity, and program designations. Among the additional information that was collected is one's position or role. If one's role is other than

teacher, then the following information was asked: length of in role and length of years supporting the implementation of the dual language program. If one's role is teacher, then the following information was also asked: length of teaching experience; length of teaching dual language students; and grade level(s) taught. Additionally, if one's role is teacher of record of dual language homeroom (not ancillary), then the following information was asked: one's certification and one's classroom teaching setting either-self-contained teaching both English and Spanish, teaming teaching English only, teaming Spanish only.

This section addresses the procedures that were used to administer the survey. According to the study district's board policy, Professional Development: Research and Publication, DME2 (Regulation) and DME Exhibits A and B, principals are to be contacted to request one's participation in the study. Per this policy, in all instances, the principal of a school has the authority to make the final decision regarding participation. Principals of the 28 potential participating schools were contacted individually via email the week prior to administering the survey requesting the participation of one's staff. Out of the 28 schools, 23 schools responded affirmative. The other five schools did not respond, although a friendly reminder phone call was placed with the principal's secretary to remind them of the request for participation sent via email. For the schools that responded affirmative, an email was sent directly to the dual language teachers and staff via the study district's email global address account explaining that the principal had granted permission to participate in the study. The email included a link to the survey and timeline of five days to complete it. The survey was administered for a two-week period. Since the researcher did not have the email addresses of the ancillary teachers in

one's database, the researcher asked the dual language coordinator to forward the email with the link to the survey to the ancillary teachers. This may have happened or not; therefore, this may account for such a low participation from the ancillary teachers. As part of the online survey, a link to the *Consent to Take Part in a Human Research Study* was provided for potential subjects. Subjects had the option of agreeing to participate in the study or declining. There was a total of 143 respondents as follows: 117 responded affirmative; three declined; and 23 started the survey, but did not complete it. Therefore, the responses for the 3 surveys that were declined and the 23 that were started and not completed were not utilized in the study. Hence, only 117 subjects participated in the study. A friendly reminder was sent midweek during the second week to remind potential subjects that wanted to give their input and perhaps have not had time and wanted to participate to do so by the end of the week.

### **Participants**

Because this study stems from utilizing the results of the *Guiding Principles for Dual Language Education* survey, cluster sampling, a naturally occurring group, of current staff members that support the implementation dual language program or teach dual language students were asked to participate. Among school personnel are principals, assistant principals, teachers (assigned to dual language homeroom), ancillary teachers, coordinators, and teacher specialists. Teachers are defined as the ones assigned to a dual language homeroom, teaching dual language students for the entire instructional day in a self-contained or teaming setting. Ancillary teachers teach dual language students part of the time via art, physical education, and music. Additionally, teacher development specialists (TDS), dual language coaches, and multilingual programs department (MPD)

specialists, dual language programming specialists, as well as an Other category which is comprised of central office support staff was asked to participate taking the online survey.

Before proceeding to present the actual number of participants, it is fitting to describe the number of potential subjects. The number of potential subjects was derived by examining the following criteria: average staff member per school; potential number of homeroom teachers, that is, teachers assigned a homeroom and teaching the dual language program for the entire day of instruction (not ancillary); the type of model 80:20 or 50:50 as well as the current grade levels offering the program. Based on the criteria listed above the potential number of subjects- ranging from administrators, to dual language homeroom teachers, to ancillary teachers, to support staff- was determined for each school and consequently for each cohort. Particularly, the potential number of staff members per cohort of schools was determined for Cohort 1, 2, and 3. The potential number of subjects per cohort was calculated as follows: Cohort 1=229; Cohort 2=99; and Cohort 3=280. If 100% of the potential subjects were to participate, the total would be 608. If one third of the potential subjects were to participate, then the total would be 200.64 potential participants.

The goal that was set was for the study was to have at least 150 potential subjects participate in the survey; however, 117 subjects participated in the survey. Out of the 28 elementary schools that were projected to participate, 23 schools accepted to participate via a written response to an email that was sent directly to each principal requesting input regarding dual language education. Although not every cohort of schools contains the same number of potential participants, the estimated average of potential participants that

declined to participate was based on the average of 22 per each of the five schools resulting in 110. Therefore, the number of potential subjects was reduced from 608 to 498. Out of the 498 potential subjects, the actual number of participants was 117. This number is about 78% of the projected goal of 150 participants and 23.5% of the 498 potential number of subjects.

**Role, gender, and ethnicity.** This section describes the subjects that participated in the survey categorized by one's role, gender, and ethnicity. Out of the 117 participants, the following roles were reported by the respondents: two principals, three assistant principals, 44 dual language teachers, four ancillary teachers, one teacher specialist, three dual language coordinators, 14 teacher development specialists, 13 multilingual programs specialists, and 33 for the other category. For the other category, participants were asked to specify. The responses varied as follows: blank, administrator, and central office. Regarding one's role, the highest three categories that participated were as follows: the teacher group comprised of dual language teachers and ancillary teachers which is 41.0%; the support staff category comprised of teacher specialists, dual language coordinator, teacher development specialists, and multilingual programs specialists combined is about 26.5%; as well as the other category which is about 28.2%. These numbers are not surprising since they reflect either one who is teaching the program or supporting the implementation of the program. The school administrator response was low since it was only 4.3%. The gender of the respondents is characterized by 81.2% female and 18.2% male. Since the schools that were asked to participate are elementary schools and generally the majority of the staff is female, it is not surprising that the majority of the participants are female. The participants reported the ethnicity as

follows: White/Caucasian 8.5%; Black/African American 5.9%; Spanish/Hispanic/Latino 76.1%; Asian/Asian American 2.6%; Pacific Islander 2.6%; Native American .9%; and other 3.4%.

**Program model.** For this section, the schools are described by the model being offered by the school either 80:20 or 50:50; length of years offering the program model; and the modality most offered by the school either one-way or two-way. For the type of model being offered by the school, 39 reported 80:20 which accounts for 33.3% and 78 reported 50:50 which is 66.7% of the total count of 117 responses. In response to the length of years the school has been offering the program, the following results were reported: 33.3% for less than three years; 49.6% for three to five years; 6.0% for five to 10 years; 3.4% for 10 to 15 years; 6.8% for more than 15 years; and .9 for other which specified 21 years. The two highest reporting categories for the length of years are less than three years with 33.3% and 3 to 5 years with 49.6%. In reviewing this data, it is not surprising since most of the models that were part of the district's expansion are 50:50 models which accounts for 66.7% of the models that were selected which began in 2014-15 and would fall under the three to five years category. For the modality most offered by schools, the following responses were reported: 15.4% reported one-way and 84.6% reported two-way. The percentage for the two-way modality is higher than the one-way. This could be reflective of a higher number of participants that offer the two-way modality having chosen to participate or it could also be attributed to the fact that this is modality most offered in the school district. The two-way modality includes two language groups, English language learners whose first language is Spanish in this case, and native English speakers learning both English and Spanish. The goal is to offer the

program to both sets of students so that these students could have opportunity to become bilingual and biliterate.

**Teachers category.** This section reports data pertaining to the teachers category which is comprised of dual language teachers and ancillary teachers. Dual language teachers (not ancillary) are assigned to homeroom and teach the core subjects to dual language students for the entire day. Ancillary or specials teachers teach art, music, physical education or other subject to dual language students part of the day. As reported earlier, the teacher category accounts for 41.0% total of the participation in the survey which is 37.6% for dual language teachers and 3.4% for ancillary teachers. Since the researcher did not have the email addresses of the ancillary teachers in one's database, the researcher asked the dual language coordinator to forward the email with the link to the survey to the ancillary teachers. This may have happened or not. Therefore, this may account for such as low participation from ancillary teachers.

This section also pertains to the teachers category which is comprised of dual language teachers and ancillary teachers. For the length of years teaching dual language students, the following was reported: less than three years 56.3%; for three to five years 25%; for five to 10 years 6.2%; for 10 to 15 years 4.2%; for more than 15 years 6.2%; and for other 2.1%. A high percentage, 56.3%, reported having less than three years of experience teaching dual language students followed by 25% for three to five years. The high percentage of 56.3% of teachers reporting having less than three years of experience can be attributed either to a higher percentage of teachers choosing to participate in the survey or it could be reflective of the number of schools that began the program in 2014-15 school year. Fourteen out of the 23 schools that accepted to participate in the survey,



which accounts for 61.6%, of the 23 schools started the program in 2014-15 which is less than three years ago. For the grades taught category, the following was reported: for Pre-Kindergarten 6.2%; Kindergarten 33.3%; first grade 21.0%; for second 27.0%; for third 4.2%; for multi-grade 2.1%; for ancillary 6.2%. For this grades taught category, Kindergarten, first, and second grades accounted for most of the teachers with 81.3% of the total participation. This could be reflective of either more of the teachers in these grade levels chose to participate or it could also be reflective of more of the 50:50 program model teachers participating which is the model comprised of most of the schools that started the program in 2014-15 whose implementation of the program is up to second grade. Only 4.2% reported teaching third grade. No teachers reported for grades fourth through fifth.

**Dual language teachers.** This section presents the data for the dual language teachers category (not ancillary). For the classroom setting one is teaching most of the time (either self-contained (both teaching English and Spanish), team teaching English only, or team teaching Spanish only), the following data was reported: 41.0% self-contained; English only 18.0%; and Spanish only 41.0%. For the certification, 77.3% reported having a bilingual certification; 15.9% reported having an ESL certification; and 6.8% reported in the other category. The high number of teachers reporting having a bilingual certification, 77.3%, could be reflective of more bilingual teachers having chosen to participate in the survey or the fact that self-contained setting, which is taught by a bilingual certified teacher, and the Spanish only setting account for 81% of the total 44 dual language teachers. For the classroom composition either one-way or two-way, the following was reported: 34.1% one-way and 65.9% two-way. The percentage for the

two-way classroom composition is higher than the one-way. This could be reflective of a higher number of teachers teaching two-way having selected to participate in the survey or it could also be attributed to the district's vision which is to offer the two-way modality. The two-way modality includes two language groups, English language learners whose first language is Spanish in this case, and native English speakers learning both English and Spanish. The goal is to offer the program to both sets of students so that these students could have opportunity to become bilingual and biliterate.

**School programming designations.** The last demographic question refers to the school program designations. There were eight designations available to choose from plus the other category as follows: Elementary School PK/K-5; PK/K-8 School, Early Childhood Center (ECC), Vanguard Neighborhood; International Baccalaureate (IB), Magnet, Title I, International Spanish Academy (ISA), and Other, please specify. For this question, participants were asked to select the designation that best describes one's school. Participants were also asked to check all that apply. The designations were reported as follows: 92.3% elementary school PK/K-5 and 7.7% PK/K-8 schools. The designation with the highest percentage which is 92.3% is reflective of the schools that participated since the survey was administered to mostly elementary school. Although most of the schools that were asked to participate offer elementary programming, it is fitting to note that two schools offer PK/K-8 grade programming out of the 28 potential schools that were asked to participate in the survey. The designation Vanguard Neighborhood is the gifted and talented program which is offered in every elementary and PK/K-8 school. Yet, 5.1% was reported as offering this designation. The low representation may be due to under-reporting or that a designation was skipped. A

participant may have failed to select a designation. For the following three designations, the percentages reported were low: 8.5% International Baccalaureate, 10.3% magnet; and 12.0% International Spanish Academy. These percentages are reflective of the district since out of the 28 potential schools that were asked to participate: four have the International Baccalaureate designation, three are magnet, and four offer the International Baccalaureate programming. As for the Title I designation, 39.3% was reported for this category.

### **Data Analysis**

As mentioned earlier, the data analysis is presented within the context of each research question for each of the strands-curriculum; instruction; and family and community. After performing the principal components analysis tests via the International Business Machines (IBM) Statistical Package for the Social Sciences (SPSS) software version 24, the data analysis is comprised of several steps involving analyzing the output data generated by SPSS. The steps explained in this section are the same steps that will be duplicated to disaggregate the data within the context of each question. One of the first steps involves verifying that the data is suitable for factor analysis. This involves reviewing several criteria. One of the criteria is to review the correlation matrix for the presence of coefficients of .3 and above. Next, the researcher would review the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) to determine that the value is .6 or above (Pallant, 2016). Also, one would need to verify that the Bartlett's Test of Sphericity value is significant (i.e. the Sig. value should be .05 or smaller) (Pallant, 2016). The second step would involve determining how many components (factors) to "extract." To do complete this step, using the Kaiser's criterion,

one would examine the components that have an eigenvalue of 1 or more (Pallant, 2016). According to Pallant (2016) to determine how many components meet this criterion, one would need to examine the Total Variance Explained table. One would examine the first set of columns, labeled Initial Eigenvalues for the components recording eigenvalues of above 1. The Cumulative % column would help to explain percent of variance.

After assessing the suitability of the data for factor analysis, the next step involves rotating the factors or items and interpreting the data. Pallant (2016) explains that “There are two main approaches to rotation, resulting in either orthogonal (uncorrelated) or oblique (correlated) factor solutions” (p.186). According to Thompson (2004) “The most common orthogonal rotation method, and indeed the most common rotation of any kind, is the varimax rotation method developed by Kaiser (1958)” (p. 42). Thompson (2004) further adds “In my experience, in about 85% of exploratory factor analysis varimax will yield a simple structure” (p.42). This study utilized the varimax rotation. The purpose of rotating the factors is to generate a pattern of loadings that facilitates easier interpretation (Pallant, 2016). Rotating the factors basically “clumps together” the variables (Pallant, 2016). Pallant notes that “This involves each of the variables loading strongly on only one component, and each component being represented by a number of strongly loading variable” (p. 185). Finally, Pallant contends that this will help one to interpret the nature of the factors by checking the variables that load strongly on each of them. In the case of the study, loadings with .5 and above were utilized to aid in interpreting the data. Additionally, the researcher would use one’s understanding of the

content of the variables, underlying theory and past research for the purposes of interpreting the data (Pallant, 2016).

Particularly, for the context of the study the process for interpreting the data is explained in this section followed by examples for components from each of the strands—curriculum, instruction, and family and community—to illustrate how specific factors within a component were examined and reviewed and how a reduced discrete element was deduced for a particular component. To aid in interpreting the data, the following process was utilized by the researcher. The researcher considered several criteria and utilized one's background knowledge in dual language, one's expertise as an educator and practitioner for over 28 years, and past research. Among the criteria that was reviewed is the weight of the factor loadings of .5 and above and the underlying commonalities and/or main concepts among most of the factors. Utilizing the criteria above and one's background knowledge in dual language and one's expertise as an educator and practitioner as well as past research, the researcher sought to find the commonalities among most of the factors to propose a reduced discrete element per component. For components wherein commonalities could not be drawn, the salient concepts that were not previously repeated among other factors were deduced as the discrete element for that particular component.

### **Research Question One: Strand 2 Curriculum**

Prior to discussing the results for the curriculum strand, it is fitting to restate the first question as well as describe the total number of deconstructed items that were part of online survey. The first question that frames the study is as follows: What are the discrete elements stemming from the curriculum strand from the *Guiding Principles for*

*Dual Language Education* deconstructed survey that could further be examined to inform programming decisions? For the curriculum strand, 24 deconstructed factors or items were part of the online survey. The 24 deconstructed items from the *Guiding Principles for Dual Language Education* were subjected to principal components analysis (PCA) using SPSS.

One of the first steps involves verifying that the data is suitable for factor analysis. This involves reviewing several criteria. One of the criteria is to review the correlation matrix for the presence of coefficients of .3 and above. Inspection of the correlation matrix revealed the presence of several coefficients of .3 and above. The Kaiser-Meyer-Olkin value was 0.916, exceeding the recommended value of .6 (Kaiser 1970, 1974 as cited in Pallant, 2016) and Barlett's Test of Sphericity (Barlett 1954 as cited in Pallant, 2016) reached statistical significance of 0.000, supporting the factorability of the correlation matrix. After assessing the suitability of the data for factor analysis, the factors or items are rotated. The study utilized the varimax rotation. As mentioned earlier, the purpose of rotating the factors is to generate a pattern of loadings that facilitates easier interpretation (Pallant, 2016).

Table 4

*Total Variance Explained Strand 2 Curriculum*

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	<b>12.815</b>	53.394	53.394
2	<b>1.471</b>	6.129	59.523
3	<b>1.304</b>	5.434	64.957
4	<b>1.170</b>	4.876	69.834
5	0.907	3.778	73.612
6	0.806	3.357	76.969
7	0.726	3.024	79.993
8	0.604	2.519	82.512
9	0.578	2.408	84.919
10	0.451	1.880	86.800
11	0.441	1.836	88.636
12	0.405	1.690	90.325
13	0.327	1.362	91.687
14	0.285	1.188	92.875
15	0.250	1.041	93.916
16	0.242	1.010	94.926
17	0.217	0.902	95.828
18	0.211	0.881	96.709
19	0.170	0.708	97.418
20	0.155	0.647	98.064
21	0.142	0.592	98.656
22	0.125	0.520	99.176
23	0.106	0.444	99.620
24	0.091	0.380	100.000

Extraction Method: Principal Component Analysis.

It is important to note that after conducting PCA, the deconstructed 24 discrete elements for the curriculum strand were reduced to 4 components. As shown in Table 4. Total Variance Explained for Strand 2 Curriculum, only the first four components listed in descending order under the Initial Eigenvalues Total column recorded eigenvalues

above one respectively as follows: 12.815; 1.471; 1.304; and 1.170. The presence of these four components with eigenvalues exceeding one explain 53%, 6.1%, 5.4%, and 4.5% of the variance respectively listed in descending order under the Initial Eigenvalues % of Variance column. Cumulatively, the four components explain a total of 69.83% of the variance listed in descending order under the Initial Eigenvalues Cumulative % column.

Specifically, after performing the varimax rotation, Table 5 Rotated Component Matrix for Strand 2 Curriculum shows four components and the weight of the factor loadings of .5 and above within each component. As shown in Table 5 Rotated Component Matrix for Strand 2 Curriculum, within each component, there is an average of three to five items or factors that display a weight of .5 or above. The factors with a weight of .5 or above are listed in descending order within each component.

Table 5

*Rotated Component Matrix<sup>a</sup> for strand 2 Curriculum*

	Component			
	1	2	3	4
c9 - There is a curriculum development that is connected to local standards.	0.801			
c4 - The curriculum includes standards for second language development for all students.	0.705			
c17 - Instruction in partner language, i.e. Spanish, builds on concepts learned in English.	0.627			0.527
c15 -The curriculum builds on linguistic skills learned in partner language, i.e. Spanish, to promote bilingualism.	0.602	0.535		
c1 -The curriculum meets district content standards regardless of language of instruction.	0.597			
c2 - The curriculum meets state content standards regardless of language of instruction.	0.592			
c20 - The curriculum is coordinated across grade levels.				



c6 - The curriculum is sensitive to the cultural backgrounds of all students.		0.797	
c16 - The curriculum builds on linguistic skills learned in English to promote bilingualism.		0.749	
c3 - The curriculum includes standards for first language development for all students.		0.690	
c7 - The curriculum is sensitive to the linguistic backgrounds of all students.		0.654	
c5 - The curriculum promotes equal status of both languages.		0.653	
c12 - The curriculum is based on general education research.			0.776
c10 - There is an implementation plan that is connected to state standards.			0.720
c8 - There is a curriculum development that is connected to state standards.			0.629
c13 - The curriculum is based on research on language learners.			0.573
c11 - There is an implementation plan that is connected to local standards.	0.507		0.550
c18 - Instruction in English builds on concepts learned in partner language, i.e. Spanish.			0.514
c14 - The curriculum is adaptable.			0.507
c22 - The curriculum is coordinated with support services, such as Spanish as a second language.			0.740
c24 - The curriculum is coordinated with support services, such as Title I.			0.518
c23 - The curriculum is coordinated with support services, such as special education.			0.645
c21 - The curriculum is coordinated with support services, such as English as a second language.			0.590
c19 - The curriculum is coordinated within grade levels.			

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Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.<sup>a</sup>

a. Rotation converged in 11 iterations.

*Note.* Since the questions contained in the online survey are deconstructed items stemming from the original Guiding Principles for Dual Language Education instrument, some of the question stems may be repeated.

For the rest of this section, examples are presented for components from the curriculum strand to illustrate the specific factors that were reviewed within a component and how a reduced discrete element was deduced for a particular component. The factor

loadings of .5 and above is listed in parenthesis after each factor. For Component 1, the following three factors were reviewed and synthesized to generate one consolidated discrete element: c9 - There is a curriculum development that is connected to local standards. (0.801); c1 -The curriculum meets district content standards regardless of language of instruction. (0.597); and c2 - The curriculum meets state content standards regardless of language of instruction. (0.592) The consolidated discrete element is as follows: The written curriculum is aligned to the required standards, i.e. state, district, or local.

Component 1 refers to curriculum development, that is, the written curriculum. In the case of this example in the state of Texas, if the written curriculum is aligned to the state standards, the logical assumption would be that it would be aligned to the district and local standards since the district must follow the state mandated curriculum. In the state of Texas, the mandated curriculum is the Texas Essential Knowledge and Skills (TEKS) (19 TAC §110-130). In other states, the required curriculum would be the Common Core State Standards (CCSS) or some other district or local adopted curricula.

It is fitting to explain that although there were seven factors identified under component 1 with loadings of .5 and above, only three were selected as follows: c9, c1, and c2. The rationale for not selecting the other factors is based on the following criteria: finite sample size and the limited frequency of the distribution of the survey to several randomly selected subjects. Having a larger sample size and having distributed the survey several times to several randomly selected subjects would have increased the strength among the variables, the loading weights, and most likely further reduced the list of factors under each component consequently increasing the validity and reliability. Since

there was a finite sample size and the survey for the study was distributed once, the researcher selected the factors that demonstrated the most commonality among the variables. The same rationale was applied to the remaining components 2-4.

For Component 2, the following three factors were reviewed and synthesized to generate one consolidated discrete element: c16 - The curriculum builds on linguistic skills learned in English to promote bilingualism. (0.749); c3 - The curriculum includes standards for first language development for all students. (0.690); and c7 - The curriculum is sensitive to the linguistic backgrounds of all students. (0.654)

The consolidated discrete element is as follows: The curriculum includes both first and second language development standards.

Since the dual language program offers programming in at least two languages, it is imperative that the curriculum include both first and second language development standards to increase language development as well as comprehensible input during content instruction (Howard et al., 2007). In the case of the study district, since the program being examined offers the dual language programming in English and Spanish, it would be critical that the curriculum integrate both first and second language development standards in both languages. Since the main modality being offered in the study district is two-way which is comprised of two language groups- English language learners whose first language is Spanish, and native English speakers-who are both learning English and Spanish, it would be vital that the curriculum integrate first and second language development standards to address the linguistic and academic needs of both groups of students.

For Component 3, the following three factors were reviewed and synthesized to generate one consolidated discrete element: c10 - There is an implementation plan that is connected to state standards. (0.720); c8 -There is a curriculum development that is connected to state standards. (0.629); and c11 - There is an implementation plan that is connected to local standards. (0.550); The consolidated discrete element is as follows: The taught curriculum is aligned to the required standards, i.e. state, district, or local.

Whereas Component 1 referred to the curriculum development, this component refers to the curriculum implementation. In this case, it refers to the taught curriculum. These three factors were consolidated into one discrete element. Programs characterized by successful student outcomes have alignment among the written curriculum to the required standards as well as to the taught curriculum and, in turn, to assessed curriculum (Howard et al., 2007).

In sum, to answer question one- what are the discrete elements stemming from the curriculum strand from the *Guiding Principles for Dual Language Education* deconstructed survey that could further be examined to inform programming decisions- principal components analysis was conducted utilizing SPSS. For the curriculum strand, 24 deconstructed factors or items were part of the online survey. After conducting principal components analysis, the 24 deconstructed items from the *Guiding Principles for Dual Language Education* were reduced to four components. Upon reviewing and synthesizing the commonalities and/or main concepts among most of the factors within each component, the following consolidated discrete elements were deduced: written curriculum is aligned to required standards, i.e. state, district, or local; integration of both first and second language development standards; taught curriculum is aligned to the

required standards, i.e. state, district, or local; and curriculum is coordinated with support services

### **Research Question Two: Strand 3 Instruction**

Prior to discussing the results for the instruction strand, it is fitting to restate the second question as well as describe the total number of deconstructed items that were part of online survey. The second question that frames the study is as follows: What are the discrete elements stemming from the curriculum strand from the *Guiding Principles for Dual Language Education* deconstructed survey that could further be examined to inform programming decisions? For the instruction strand, 37 deconstructed factors or items were part of the online survey. The 37 deconstructed items from the *Guiding Principles for Dual Language Education* were subjected to principal components analysis (PCA) using SPSS.

To assess the suitability of the data for factor analysis, several criteria were reviewed. Inspection of the correlation matrix revealed the presence of several coefficients of .3 and above. The Kaiser-Meyer-Olkin value was 0.865, exceeding the recommended value of .6 (Kaiser 1970, 1974) and Barlett's Test of Sphericity (Barlett 1954) reached statistical significance of 0.000, supporting the factorability of the correlation matrix. After assessing the suitability of the data for factor analysis, the factors or items are rotated. The study utilized the varimax rotation.

Table 6

*Total Variance Explained Strand 3 Instruction*

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	<b>17.262</b>	46.653	46.653
2	<b>2.327</b>	6.290	52.943
3	<b>2.015</b>	5.447	58.391
4	<b>1.579</b>	4.267	62.657
5	<b>1.557</b>	4.207	66.865
6	<b>1.358</b>	3.671	70.536
7	<b>1.268</b>	3.426	73.962
8	<b>1.105</b>	2.987	76.949
9	<b>1.030</b>	2.784	79.733
10	0.805	2.176	81.909
11	0.742	2.005	83.915
12	0.646	1.746	85.661
13	0.623	1.683	87.344
14	0.572	1.545	88.889
15	0.460	1.243	90.132
16	0.403	1.088	91.221
17	0.362	0.979	92.200
18	0.327	0.884	93.083
19	0.294	0.794	93.877
20	0.274	0.741	94.618
21	0.232	0.628	95.246
22	0.221	0.598	95.845
23	0.214	0.579	96.424
24	0.196	0.529	96.953
25	0.178	0.480	97.433
26	0.136	0.369	97.801
27	0.131	0.355	98.157
28	0.117	0.317	98.474
29	0.103	0.279	98.753
30	0.095	0.256	99.009
31	0.078	0.212	99.220
32	0.061	0.165	99.385
33	0.059	0.159	99.545
34	0.050	0.134	99.679
35	0.045	0.121	99.800
36	0.044	0.119	99.919
37	0.030	0.081	100.000

Extraction Method: Principal Component Analysis.

It is important to note that after conducting PCA, the deconstructed 37 discrete elements from the online survey for the instruction strand were reduced to nine components. As shown in Table 6 Total Variance Explained for Strand 3 Instruction, only the first nine components listed in descending order under the Initial Eigenvalues Total recorded eigenvalues above one respectively as follows: 17.262; 2.327; 2.015; 1.579; 1.557; 1.358; 1.268; 1.105; and 1.030. The presence of these nine components with eigenvalues exceeding one explain 46.653; 6.290; 5.447; 4.267; 4.207; 3.671; 3.426; 2.987; and 2.784 of the variance respectively listed in descending order under the Initial Eigenvalues % of Variance column. Cumulatively, the nine components explain a total of 79.733 % of the variance listed in descending order under the Initial Eigenvalues Cumulative % column.

Specifically, after performing the varimax rotation, Table 7 Rotated Component Matrix for Strand 3 Instruction shows four components and the weight of the factor loadings of .5 and above within each component. As shown in Table 7 Rotated Component Matrix for Strand 3 Instruction, within each component there is an average of three to six items or factors that display a weight of .5 or above. The factor loadings of .5 or above are listed in descending order within each component.

Table 7

*Rotated Component Matrix<sup>a</sup> Strand 3 Instruction*

	Component								
	1	2	3	4	5	6	7	8	9
i31 - There is cultural equity in the classroom.	0.714								
i5 - The program design is faithfully implemented in the classroom.	0.680								
i33 - Instruction takes language varieties into consideration.	0.612								
i32 - There is linguistic equity in the classroom.	0.605								
i6 - The program curriculum is faithfully implemented in the classroom.	0.604								
i27 - Teachers create opportunities for meaningful language use.	0.582			0.536					
i7 - Instruction incorporates appropriate separation of languages according to program design.									
i19 - Instructional staff incorporates technology, such as the Internet into their instruction.									
i8 - Teachers use a variety of strategies to ensure student comprehension.		0.821							

(continued)



	Component								
	1	2	3	4	5	6	7	8	9
i29 - Instructional strategies build independence of the learning process.	0.506	0.620							
i15 - Teachers use sheltered instruction strategies, such as using routines and structures to promote second language development.		0.598		0.507					
i24 - Teachers use active learning strategies, such as thematic instruction in order to meet the needs of diverse learners.		0.590							
i11 - Teachers integrate language and content instruction.		0.583				0.513			
i30 - Instructional strategies build ownership of the learning process.		0.556		0.526					
i3 - Academic content instruction is provided in partner language, i.e. Spanish			0.705						
i9 - Instruction promotes metalinguistic awareness.			0.693						
i10 - Instruction promotes metacognitive skills.			0.670						
i1 -Explicit language arts instruction is provided in partner language, i.e. Spanish			0.645						

(continued)

	Component								
	1	2	3	4	5	6	7	8	9
i16 - Instruction is geared toward the needs of native speakers when they are integrated for instruction.			0.573						
i17 - Instruction is geared toward the needs of second language learners when they are integrated for instruction.			0.561						
i13 - Teachers use sheltered instruction strategies, such as using routines and structures to facilitate comprehension									
i18 - Instructional staff incorporates technology such as multimedia presentations.				0.746					
i12 - Teachers use sheltered instruction strategies, such as building on prior knowledge to facilitate comprehension				0.714					
i25 - Teachers use active learning strategies, such as cooperative learning in order to meet the needs of diverse learners.				0.589					
i14 - Teachers use sheltered instruction strategies, such as building on prior knowledge promote second language development.									
i20 - Support staff coordinates their instruction with the dual language model.					0.813				

(continued)

	Component								
	1	2	3	4	5	6	7	8	9
i23 - Specials teachers coordinate their instruction with the dual language approaches.					0.796				
i22 - Specials teachers coordinate their instruction with the dual language model.					0.746				
i21 - Support staff coordinates their instruction with the dual language approaches.					0.740				
i26 - Teachers use active learning strategies, such as learning centers in order to meet the needs of diverse learners.						0.780			
i28 - Student grouping maximizes opportunities for students to benefit from peer models.						0.575			
i35 - Instructional materials in partner language, i.e. Spanish, encourage cross-cultural appreciation.							0.774		
i36 - Instructional materials in English reflect the student population in the program.							0.683		
i37 - Instructional materials in English encourage cross-cultural appreciation.	0.507						0.626		
i4 - Academic content instruction is provided in English								0.784	

(continued)

	Component								
	1	2	3	4	5	6	7	8	9
i2 - Explicit language arts instruction is provided in English								0.566	
i34 - Instructional materials in partner language, i.e. Spanish reflect the student population in the program.									0.743
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. <sup>a</sup>									
a. Rotation converged in 20 iterations.									

*Note.* Since the questions contained in the online survey are deconstructed items stemming from the original Guiding Principles for Dual Language Education instrument, some of the question stems may be repeated.

For the rest of this section, examples are presented for components from the instruction strand to illustrate the specific factors that were reviewed within a component and how a reduced discrete element was deduced for a particular component. The factor loadings of .5 and above is listed in parenthesis after each factor. For Component 1, the following three factors were reviewed and synthesized to one consolidated discrete element: i33 - Instruction takes language varieties into consideration. (0.612); i32 - There is linguistic equity in the classroom. (0.605); and i27 - Teachers create opportunities for meaningful language use. (0.582). The consolidated discrete element is as follows: Instruction promotes linguistic equity.

For this component, the three elements were reduced to one discrete element. The common underlying concepts is that instruction fosters linguistic equity for both the languages being taught in the program. Both languages are respected and valued equitably. One of the major underlying tenets of dual language programs demonstrating

successful student outcomes is that time is devoted to instruction in and through each of the two languages (Howard et al., 2007). Sustained periods of instruction in each language promote high levels of language and academic development and proficiency in each of the languages (Howard et al., 2007).

It is fitting to explain that although there were eight factors identified under component 1 with loadings of .5 and above, only three were selected as follows: i33, i32, and i27. The rationale for not selecting the other factors is based on the following criteria: finite sample size and the limited frequency of the distribution of the survey to several randomly selected subjects. Having a larger sample size and having distributed the survey several times to several randomly selected subjects would have increased the strength among the variables, the loading weights, and most likely further reduced the list of factors under each component consequently increasing the validity and reliability. Since there was a finite sample size and the survey for the study was distributed once, the researcher selected the factors that demonstrated the most commonality among the variables. The same rationale was applied to the remaining components 2-9.

For Component 2, the following five factors were reviewed and synthesized to generate one consolidated discrete element: i8 - Teachers use a variety of strategies to ensure student comprehension. (0.821); i29 - Instructional strategies build independence of the learning process. (0.620); i15 - Teachers use sheltered instruction strategies, such as using routines and structures to promote second language development. (0.598); i24 - Teachers use active learning strategies, such as thematic instruction in order to meet the needs of diverse learners. (0.590); and i30 - Instructional strategies build ownership of

the learning process. (0.556). The consolidated discrete element is as follows: hands-on learning strategies facilitate comprehensible input.

For this component, five factors were synthesized to one discrete element. Since a dual language program uses two languages during instruction, one of the main underlying principles of the program is that it integrates language instruction and subject matter and that it incorporate strategies to make content comprehensible or accessible to both language groups (Howard et al., 2007).

For Component 5, the following four factors were reviewed and synthesized to generate one consolidated discrete element: i20 - Support staff coordinates their instruction with the dual language model. (0.813); i23 - Specials teachers coordinate their instruction with the dual language approaches. (0.796); i22 - Specials teachers coordinate their instruction with the dual language model. (0.746); and i21 - Support staff coordinates their instruction with the dual language approaches. (0.740)

The consolidated discrete element is as follows: Support staff incorporate dual language strategies in their instruction.

For this component, four factors were reduced to one discrete element. For the program to be successful, the entire faculty and support staff, that is, specials or ancillary teachers as well as interventionists or other teaching staff needs to participate in professional development that integrates dual language strategies and implement the strategies consistently school wide (Collier & Thomas, 2014). Successful dual language programs have support from the entire school community. Collier and Thomas (2014) cite “Everyone on campus needs to completely understand the framework of the program,

the process of first and second language acquisition, and how to provide opportunities to develop academic language in both program languages” (p. 56).

In sum, to answer question two- what are the discrete elements stemming from the instruction strand from the *Guiding Principles for Dual Language Education* deconstructed survey that could further be examined to inform implementation decisions- principal components analysis was conducted utilizing SPSS. For the instruction strand, 37 deconstructed factors or items were part of the online survey. After conducting principal components analysis, the 37 deconstructed items from the *Guiding Principles for Dual Language Education* were reduced to nine components. Upon reviewing and synthesizing the commonalities and/or main concepts among most of the factors within each component, the following consolidated discrete elements were deduced: integration of linguistic equity during instruction; hands-on learning strategies facilitate comprehensible input; explicit language arts instruction in partner language, i.e. Spanish; infusion of a variety of sheltered instruction strategies; support staff incorporate dual language strategies; language and content are integrated during instruction; culturally relevant materials are integrated during instruction to reflect student population, i.e. English; explicit language arts instruction in English; and culturally relevant materials are integrated during instruction to reflect student population of partner language, i.e. Spanish.

### **Research Question Three: Strand 6 Family and Community**

Prior to discussing the results for the family and strand, it is fitting to restate the third question as well as describe the total number of deconstructed items that were part of online survey. The third question that frames the study is as follows: What are the

discrete elements stemming from the family and community strand from the *Guiding Principles for Dual Language Education* deconstructed survey that could further be examined to inform implementation decisions? For the family and community strand, 21 deconstructed factors or items were part of the online survey. The 21 deconstructed items from the *Guiding Principles for Dual Language Education* were subjected to principal components analysis (PCA) using SPSS.

To assess the suitability of the data for factor analysis, several criteria were reviewed. Inspection of the correlation matrix revealed the presence of several coefficients of .3 and above. The Kaiser-Meyer-Olkin value was 0.858, exceeding the recommended value of .6 (Kaiser 1970, 1974) and Barlett's Test of Sphericity (Barlett 1954) reached statistical significance of 0.000, supporting the factorability of the correlation matrix. After assessing the suitability of the data for factor analysis, the factors or items are rotated. The study utilized the varimax rotation.

It is important to note that after conducting PCA, the deconstructed 21 discrete elements from the online survey for the family and community strand were reduced to four components. As shown in Table 8 Total Variance Explained for Strand 3 Instruction, only the first four components listed in descending order under the Initial Eigenvalues Total recorded eigenvalues above one respectively as follows: 11.368; 1.679; 1.319; and 1.185. The presence of these four components with eigenvalues exceeding one explain 54.131; 7.997; 6.283; and 5.644 of the variance respectively listed in descending order under the Initial Eigenvalues % of Variance column. Cumulatively, the four components explain a total of 74.055 % of the variance listed in descending order under the Initial Eigenvalues Cumulative % column.



Table 8

*Total Variance Explained Strand 6 Family and Community*

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	<b>11.368</b>	54.131	54.131
2	<b>1.679</b>	7.997	62.128
3	<b>1.319</b>	6.283	68.411
4	<b>1.185</b>	5.644	74.055
5	0.811	3.864	77.919
6	0.775	3.692	81.611
7	0.699	3.330	84.941
8	0.565	2.689	87.630
9	0.459	2.185	89.815
10	0.396	1.884	91.699
11	0.310	1.478	93.177
12	0.274	1.306	94.483
13	0.239	1.140	95.623
14	0.210	1.000	96.623
15	0.163	0.774	97.398
16	0.145	0.688	98.086
17	0.118	0.563	98.649
18	0.087	0.413	99.063
19	0.084	0.398	99.461
20	0.065	0.311	99.772
21	0.048	0.228	100.000

Extraction Method: Principal Component Analysis.

Specifically, after performing the varimax rotation, Table 9 Rotated Component Matrix for Strand 6 family and community shows only four components and the weight of the factor loadings of .5 and above within each component. As shown in Table 9 Rotated Component Matrix for Strand 6 Family and Community within each component, there is an average of three to six items or factors that display a weight of .5 or above.

However, Component 1 shows 13 factors with loadings of .5 and above. The factors with a weight of .5 or above are listed in descending order within each component.

Table 9

*Rotated Component Matrix<sup>a</sup> Strand 6 Family and Community*

	Component			
	1	2	3	4
f11 - The program meets parents' needs in supporting their children's living in the community.	0.836			
f13 - Activities are designed to bring parents together to promote cross-cultural awareness.	0.835			
f5 - Staff development topics include working equitably with families.	0.805			
f12 - Activities are designed to bring parents together.	0.746			
f18 - The program allows for many different levels of talents of parents.	0.712			
f6 - Staff development topics include working equitably with the community.	0.705			
f9 - The program incorporates ongoing parent education that is designed to help parents advocate for the program.	0.694			
f21 - The program takes advantage of community language resources.	0.666		0.557	
f8 - The program incorporates ongoing parent education that is designed to help parents support the program.	0.657			
f17 - The program allows for many different levels of comfort for parents.	0.647			
f7 - The program incorporates ongoing parent education that is designed to help parents understand the program.	0.608			

(continued)

	Component			
	1	2	3	4
f16 - The program allows for many different levels of participation of parents.	0.600			
f10 - The program meets parents' needs in supporting their children's education in the community.	0.588			
f1 - There is a staff member designated as liaison with families associated with the program.		0.772		
f2 - There is a staff member designated as liaison with communities associated with the program.		0.716		
f3 - Office staff members have bilingual proficiency.		0.667		
f4 - Office staff members have cross-cultural awareness.				
f20 - The program establishes an advisory structure for input from community members.			0.874	
f19 - The program establishes an advisory structure for input from parents.			0.816	
f14 - Communication with parents is in the appropriate language.				0.8 11
f15 - Communication with the community is in the appropriate language.				0.7 38
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. <sup>a</sup>				
a. Rotation converged in 6 iterations.				

*Note.* Since the questions contained in the online survey are deconstructed items stemming from the original Guiding Principles for Dual Language Education instrument, some of the question stems may be repeated.

For the rest of this section, examples are presented for components from the family and community strand to illustrate the specific factors that were reviewed within a component and how a reduced discrete element was deduced for a particular component. The factor loadings of .5 and above is listed in parenthesis after each factor. For

Component 1, the following nine factors were reviewed and synthesized to generate one consolidated discrete element: f11 - The program meets parents' needs in supporting their children's living in the community. (0.836); f13 - Activities are designed to bring parents together to promote cross-cultural awareness. (0.835); f18 - The program allows for many different levels of talents of parents. (0.712); f9-The program incorporates ongoing parent education that is designed to help parents advocate for the program. (0.694); f8 - The program incorporates ongoing parent education that is designed to help parents support the program. (0.657); f17 - The program allows for many different levels of comfort for parents. (0.647); f7 - The program incorporates ongoing parent education that is designed to help parents understand the program. (0.608); f16 - The program allows for many different levels of participation of parents. (0.600); and f10 - The program meets parents' needs in supporting their children's education in the community. (0.588). The consolidated discrete element is as follows:

The program offers a variety of parent engagement activities ranging from social, educational, multicultural, etc.

For component 1, nine factors were reduced to one discrete element. The underlying principle is that effective programs incorporate a variety of home/school collaboration activities to aid in developing a sense of efficacy in parents toward their children's education that is transmitted to their children and results in positive consequences leading to heightening an interest in schoolwork and improved academic achievement and behavior (Howard et al., 2007).

It is fitting to explain that although there were thirteen factors identified under component 1 with loadings of .5 and above, only nine were selected as follows: f11, f13,

f18, f9, f8, f17, f7, f6, and f10. The rationale for not selecting the other factors is based on the following criteria: finite sample size and the limited frequency of the distribution of the survey to several randomly selected subjects. Having a larger sample size and having distributed the survey several times to several randomly selected subjects would have increased the strength among the variables, the loading weights, and most likely further reduced the list of factors under each component consequently increasing the validity and reliability. Since there was a finite sample size and the survey for the study was distributed once, the researcher selected the factors that demonstrated the most commonality among the variables. The same rationale was applied to the remaining components 2-4.

For Component 2, the following three factors were reviewed and synthesized to generate one consolidated discrete element: f2 - There is a staff member designated as liaison with communities associated with the program. (0.772); f3 - Office staff members have bilingual proficiency. (0.716); and f4 - Office staff members have cross-cultural awareness. (0.667). The consolidated discrete element is as follows: Bilingual staff member(s) serves as liaison with the community. For this component, three factors were reduced to one discrete element. The underlying principle is that ... “one way of providing a warm and welcoming environment is to provide a parent liaison who speaks the languages of the program and understands the needs to the parents in the community” (Howard et al., 2007, p. 36).

In sum, to answer question three (What are the discrete elements stemming from the family and community strand from the *Guiding Principles for Dual Language Education* deconstructed survey that could further be examined to inform implementation

decisions?), principal components analysis was conducted utilizing SPSS. For the family and community strand, 21 deconstructed factors or items were part of the online survey. After conducting principal components analysis, the 21 deconstructed items from the *Guiding Principles for Dual Language Education* were reduced to four components. Upon reviewing and synthesizing the commonalities and/or main concepts among most of the factors within each component, the following consolidated discrete elements were deduced: variety of parent engagement activities; bilingual staff member(s) serves as liaison with community; program includes an advisory structure; and communication with parents is in appropriate language.

### **Summary**

After conducting principal components analysis, the 82 original deconstructed items or factors that were part of the online survey were reduced to 17 components which is about 21.1%, or one-fifth, of the original number of items or factors. The 24 deconstructed items for the curriculum strand were reduced to four components. The 37 deconstructed items for the instruction strand were reduced to nine components and the 21 deconstructed items for the family and community strand were reduced to four components. The aggregated reduction of the three strands is 17 components. The null hypothesis stated that there would be no change and that all 82 discrete elements included in the online survey would emerge after conducting principal components analysis. The alternative hypothesis stated that there would be change and that a reduced number of discrete elements would emerge from the statistical clustering analysis. The alternative hypothesis stated that out of the 82 discrete elements a reduced number by approximately less than half resulting in less than 40 discrete elements would emerge after conducting

principal components analysis. Based on the results of the investigation, the null hypothesis is rejected in favor of the alternative hypothesis. Yet, it is important to note that since the 82 items were reduced to 17 components. As a result of the findings, the reduction of less than half resulting in less than 40 discrete elements is more specifically defined by being reduced by about 80 percent.

After analyzing each of the 17 components, Table 10 Summary of Consolidated Reduced Discrete Elements shows the findings of the study. Table 10 shows the consolidated discrete elements by strand in response to the 3 guiding questions that frame the study.

Table 10

*Summary of Consolidated Reduced Discrete Elements*

Strand	Online Survey Deconstructed Items	Reduced Discrete Elements
2 Curriculum	24	4 components: <ul style="list-style-type: none"> <li>• written curriculum is aligned to the required standards, i.e. state, district, or local;</li> <li>• integration of both first and second language development standards;</li> <li>• taught curriculum is aligned to the required standards, i.e. state, district, or local; and</li> <li>• curriculum is coordinated with support services</li> </ul>
3 Instruction	37	9 components: <ul style="list-style-type: none"> <li>• integration of linguistic equity during instruction;</li> <li>• hands-on learning strategies to facilitate comprehensible input;</li> <li>• explicit language arts instruction in partner language, i.e. Spanish</li> <li>• infusion of a variety of sheltered instruction strategies;</li> <li>• support staff incorporate dual language strategies;</li> <li>• language and content are integrated during instruction;</li> <li>• culturally relevant materials are integrated during instruction to reflect student population, i.e. English;</li> </ul>

6 Family and Community	21	<ul style="list-style-type: none"> <li>• explicit language arts instruction in English; and</li> <li>• culturally relevant materials are integrated during instruction to reflect student population of partner language, i.e. Spanish</li> </ul> <p>4 components:</p> <ul style="list-style-type: none"> <li>• variety of parent engagement activities;</li> <li>• bilingual staff member(s) serves as liaison with community;</li> <li>• program includes an advisory structure; and</li> <li>• communication with parents is in appropriate language</li> </ul>
82		17

*Note.* Table 10 shows the findings of the study. After conducting principal components analysis, the 82 items stemming from the original Guiding Principles for Dual Language Education instrument that comprised the online survey were reduced to 17 components or discrete elements.

Identifying the discrete elements from practitioners in the field at the micro level could further assist to inform the practice, policy development, and research in the field at the macro level. First, practitioners—school leaders, teachers, and district support leaders—could impact the practice by setting goals and executing changes to improve the implementation of the dual language program, increasing student achievement and ultimately aiding to close the achievement gap for English language learners. At the macro level, it could further ignite the enactment of policies at the state and national level that continue to refine program design fostering the expansion of program offerings. Additionally, the findings of this study could germinate research in the field to further examine the internal and external social, economic, and political factors associated with successful student outcomes and effective program implementation in school districts across the state and the nation striving to continue to advance dual language programming.



## **Chapter V**

### **Discussion**

#### **Introduction**

This chapter presents an introduction, an analytical summary section, implications and recommendations for practice, policy, and research, followed by a conclusion. As stated in the prelude of the study, scholars in the field of school reform corroborate that “Among school-related influences on student learning, leadership is second in importance only to classroom instruction” (Wallace Foundation, 2010, p.1). Furthermore, scholars postulate that to obtain large effects on student learning, school leadership is critical because it serves as a catalyst to leverage synergy among relevant variables (Louis et al., 2010). Given the extant body of research documenting ELLs academic success having participated in well-implemented programs fuels practitioners from the field—school leaders and district support leaders—to continue to strive to leverage the type and quality of the educational inputs. Leveraging the educational inputs includes monitoring and evaluating the effectiveness of the dual language program by examining a broad spectrum of metrics including academic assessment data as well as the quality of implementation.

For the context of the study, in addition to the state statutes mandating the evaluation of the dual language program, the necessity to find a tool to aid in monitoring and evaluating the effectiveness of the dual language program was born at the micro level from practitioners from the field—school leaders, teachers, instructional coaches, and district support personnel—with the goal of striving to continue to ensure successful student outcomes. In seeking for a tool to aid in monitoring and evaluating the dual language program, the *Guiding Principles for Dual Language Education* instrument

emerges as a recommended tool by renowned scholars in the field (Collier & Thomas, 2014). However, when critically examining the utility of the original national *Guiding Principles for Dual Language Education* paper-and-pencil survey, the statements are comprised of double and triple barrel statements. The latter presents a challenge for practitioners in the field to identify which individual item should be measured in the first place, but, furthermore, it is nearly impossible to measure a discrete element independently at a time. After having deconstructed the original survey, the study conducted principal components analysis with the goal of reducing the discrete elements for three strands: curriculum; instruction; and family and community. The findings yielded a reduced list of discrete elements by consolidating the 82 items to 17 components. The reduced discrete elements are considered critical contributors to effective dual language programming that could inform programming and implementation decisions in the areas of curriculum; instruction; and family and community. Additionally, the discrete elements could further aid in monitoring and evaluation the effectiveness of the program consequently impacting favorably student achievement.

### **Analytical Summary**

This section addresses instrumentation and data analysis and its ramifications for the study. For the context of the study, the *Guiding Principles for Dual Language Education* online survey contained 82 items stemming from 3 strands: curriculum; instruction; and family and community. After conducting principal components analysis, the findings showed that online survey comprising 82 items was reduced by about 80% resulting in 17 components. The null hypothesis was rejected in favor of the alternative

hypothesis. It is fitting to note that the alternative hypothesis stated that after conducting principal components analysis, the items would be reduced by half. Yet, the findings of the study showed that the items were reduced by about 80%. If the trend were to continue, then the original 245 items could have possibly been reduced by 80% which would have reduced the list to 49 items. The latter has ramifications for the practice in that utilizing principal components analysis has potential implications for increasing cost effectiveness and time efficiency for practitioners in the field. Among the mounting demands to maximize instructional time, practitioners do not have time to participate in long surveys when the process could have been streamlined to begin with and could still yield the desired outcome. It would be more cost effective and time efficient to take a survey that is comprised of 49 items versus 245 items. Additionally, increasing cost effectiveness and time efficiency is paramount because the input from practitioners in the field is critical to informing the practice.

It is fitting to revisit the controversy over sample size versus examining the strength among the factors as it pertains to the study. One theater of thought advocates for sample size and the recommended size varies among scholars. Some scholars advocate for at least 10 cases per each item and the subjects-to-variables (STV) ratio should be no lower than five (Bryant & Yarnold, 1995). Others argue for at least 150-300 cases (Hutcheson & Sofroniou, 1999). Yet, others advocate for at least 200 cases, regardless of the STV (Gorsuch, 1983). Another camp of thought argues that the needed sample size is conditional upon the strength of the factors. In the case of the study, although the sample size was 117, the strength among the factors aided in grounding the findings. Most certainly, a larger sample size would have been gratifying to the study.

Yet, the strength among the variables was instrumental in facilitating the interpretation of the data and solidifying the findings.

As mentioned earlier, the study has limitations as it relates to utilizing the principal components analysis technique. PCA involves conducting several tests by administering the survey several times to randomly selected subjects each time. As a result of deconstructing the 103 key points found in the original survey, 245 total items were deduced. Yet, only 82 items were part of the online survey. The online survey is comprised of three strands: (2) curriculum; (3) instruction; and (6) family and community. While the goal of study is to conduct principal components analysis to arrive at a reduced list of discrete elements that could contribute to successful student outcomes in dual language programming, PCA would need to be conducted utilizing the remaining 162 items for the online survey to reach its maximum potential of measuring all the items. The latter 162 items were derived after deconstructing the other key points belonging to other strands as follows: (1) assessment and accountability; (4) staff quality and professional development; (5) program structure; and (7) support and resources. In the case of the study, the online survey was administered for three strands containing 82 items. Therefore, the deconstructed items under each strand would need to undergo several tests before narrowing the list to a reduced number of discrete elements per strand.

Additionally, a dichotomy lies during the interpretation of the data- the last stage of the data analysis- in that science and art converge. After assessing the suitability of the data for factor analysis and determining how many components or factors to extract, the last stage involves rotating the factors and interpreting the data. Science and art

interphase in that the researcher examines each component to verify the variables with the highest loading weights and uses this information along with the researcher's understanding of the content of the variables, underlying theory and past research for the purposes of interpreting the data (Pallant, 2016). In the case of the study, to aid in interpreting the data science and art converged on two fronts. The science part involves having selected loadings of .5 and above and the art part involves utilizing the researcher's background knowledge in dual language, one's expertise as an educator and practitioner for over 28 years, and past research. While the convergence may seem partly subjective, it provides a system of checks and balances between the selecting the loadings with the highest weights and using one's expertise and past research in interpreting the data. This is the juncture where the science and art- the practice- meet. One cannot exist without the other. It is a mutually symbiotic relationship that makes the research relevant to the practice and the practice to the research.

For example, to interpret the data for component one stemming from the curriculum strand, it was vital for the researchers to utilize the loadings with .5 and above since the strength of the factors can supplant the sample size (Beavers et al., 2013). Yet, this information aids to half of the interpretation. The other half lies in utilizing the researcher's background knowledge, expertise and past research relevant to interpreting the commonalities among the factors and synthesizing the data. For Component 1, the following 3 factors were reviewed and synthesized to generate one consolidated discrete element: c9 - There is a curriculum development that is connected to local standards. (0.801); c1 -The curriculum meets district content standards regardless of language of instruction. (0.597); and c2 - The curriculum meets state content standards regardless of

language of instruction. (0.592). The consolidated discrete element is as follows: The written curriculum is aligned to the required standards, i.e. state, district, or local.

Component 1 refers to curriculum development, that is, the written curriculum. In the case of this example in the state of Texas, if the written curriculum is aligned to the state standards, the logical assumption would be that it would be aligned to the district and local standards since the district must follow the state mandated curriculum. In the state of Texas, the mandated curriculum is the Texas Essential Knowledge and Skills (TEKS) (19 TAC §110-130). In other states, the required curriculum would be the Common Core State Standards (CCSS) or some other district or local adopted curricula.

In sum, despite the limitations of the study and the finite sample size, the findings of the study contribute to the field of research at large. The findings showed that after conducting principal components analysis, the 82 items were reduced to 17 components. This was a reduction of about 80%. If the trend were to continue, then the original 245 items could have possibly been reduced by 80% which would have reduced the list to 49 items. Therefore, utilizing principal components analysis has potential implications for increasing cost effectiveness and time efficiency for researchers and practitioners in the field. Among the mounting demands to maximize instructional time, practitioners do not have time to participate in long surveys when the process could have been streamlined to begin with and could still yield the desired outcome. When developing surveys, it is recommended that researchers in the field consider utilizing principal components analysis to aid in the early stages of developing a survey. It would be more cost effective and time efficient to streamline a survey in the first place for the researchers and the

practitioners, than to disseminate a lengthy survey when the desired outcome could have been met with a succinct version.

It would be more cost effective and time efficient to take a survey that is comprised of 49 items versus 245 items. Additionally, increasing cost effectiveness and time efficiency is paramount because the input from practitioners in the field is critical to informing the practice. In the case of the study, the online survey that was disseminated contained 82 items for three strands: curriculum, instruction, and family and community since the purpose was to conduct principal components analysis to aid in reducing the discrete elements that are critical contributors to increased student outcomes in dual language programming. While the findings of the study yielded a reduced list of 17 components, it would have been beneficial to the practice having had an opportunity to take a survey including all seven strands. If the original the *Guiding Principles for Dual Language Education* survey would have undergone principal components analysis technique previously and had maintained a similar pattern of reducing the items by 80% as in the study, the participants would have rather taken a survey including all seven strands with 49 items versus one with 82 items addressing only three strands.

### **Implications and Recommendations for Practice**

The findings of the study have implications for the practitioners in the field. One implication for practitioners to cogitate when considering using a prospective survey for the purposes of monitoring or evaluating the program is to examine the instrument critically by reviewing the construction of the questions being asked to the respondents. It is recommended that questions be clear to the respondents as well as answerable (Newcomer & Triplett, 2010). For example, in reference to surveys, it is recommended

that the questions be as short and clear as possible focusing on a single issue or item and avoid double-barreled questions (Adam, 2010). Another criterion to consider when examining a prospective survey is the nature of the scale. For example, if the survey is asking respondents to give their perceptions about a specific item, it is recommended that the scale be consistent in providing a list of options for the respondents to select from rather than asking for volunteer responses (Newcomer & Triplett, 2010). It is also recommended that the survey utilize an odd-numbered scale, such as 1 to 5 or 1 to 7 to avoid the middle value syndrome with short descriptors defining the end points (Newcomer & Triplett, 2010). In reference to using scales, Newcomer and Triplett (2010) cite the following “Using a numerical scale in which only the end points are defined (such as 1 to 7 scale, where 1 equals not at all useful and 7 means extremely useful) is preferable to using adjectives (such as poor, fair, and above average), because numbers are less fraught with connotations that vary across respondents” (p. 279). For the context of the study, however, the online *Guiding Principles for Dual Education* survey utilized the same descriptors from the original survey—not observed, minimal, partial, full, or exemplary to preserve the authenticity of the original survey. Not observed was added to the online survey as an answer choice to allow for respondents to select it if the other options were not applicable.

As part of examining a full range of data to aid in monitoring and evaluating the effectiveness of the dual language program including the results of student assessment data, it is recommended that practitioners (school leaders, teachers, instructional coaches, and district support personnel) utilize the findings of the study—the reduced list of discrete elements for the curriculum, instruction, and family and community strands at



individual campus sites and/or district-wide to aid in monitoring and evaluating the quality of implementation in these three areas. Based on the outcome of the evaluation, the individual school or district would then compile the data and analyze to identify areas of strength and opportunities for growth. The goal would be to use the data to draft either a needs assessment and/or action plan listing goals to aid in refining the practice.

Additionally, practitioners- district instructional leaders and supervisors in conjunction with principals- can utilize the findings of the study relevant to the three strands- curriculum, instruction, and family and community- to collaborate in developing customized protocols to address problems of practice during instructional rounds to further aid in monitoring and evaluating the program. In *Central Office Transformation for District-wide Teaching and Learning Improvement*, Honig, Copland, Rainey, Lorton, and Newton (2010) recommend the use of various conceptual tools as well as practical tools to aid in addressing the quality of classroom teaching and learning as fundamental to one's instructional leadership ranging from teaching and learning frameworks, to school walk-throughs and other classroom observation protocols, to cycle-of-inquiry protocols to data-based protocols. Particularly, in reference to cycle-of-inquiry protocols, Honig et al., (2010), p. 39, posit that

...cycle-of-inquiry protocols have been associated with helping improve principals' (and other professionals') work practices when they prompt principals to identify a specific problem of practice related to their efforts to improve teaching and learning; to collect evidence to help them better understand the underlying causes of that problem; to develop strategies supported by a rationale for how the course of action would address the problem; and finally, to

continually collect evidence to assess progress toward solving the problem of practice.

### **Implications and Recommendations for Policy**

The findings of the study have implications for policy development on several fronts. On one front, given the extant robust body of research reporting the high academic success of English learners having participated in well-implemented dual language immersion programs (Thomas & Collier, 1997, 2002, 2009, & 2012), compels continued policy development in the realm of advocating to offer the program to serve English language learners at the federal, state, and local levels. Lessons learned from failed results from “structured English immersion” programs intending to teach English to immigrant students in just one school year cradled in English-only legislation, anti-bilingualism policy, in California (1998), Arizona (2000), and Massachusetts (2002) further attest to the need for continued policy development in the realm of advocating to offer the program (Crawford, 2006). The findings documenting the failed results of structured English immersion are affirmed by the body of research in the field of dual language education. Among the seminal studies, it is that of Drs. Collier and Thomas which compares English language learners’ performance relative to that of monolingual students across seven programs including Proposition 227 (Collier & Thomas, 2009). Proposition 227 provides the least amount of support for English learners. “In fact, when compared to the other ELL programs, this program type has resulted in the lowest achievement for English learners of any program in the U.S.” (Collier & Thomas, 2009, p. 61).

It is fitting to note that Proposition 58, the California Non-English Allowed in Public School Act (Senate Bill 1174), repealed the English-only immersion requirement and waiver provisions required by Proposition 227 of 1998 in November of 2016. Proposition 58 allows schools to utilize multiple programs, including bilingual education. Pally (2016), p. 2, cites some of the provisions contained in the law as follows:

requires that school district solicit parent and community input in developing language acquisition programs to ensure; authorizes school districts to establish dual-language immersion programs for both native and non-native English speakers; and allows parents/legal guardians of students to select an available language acquisition program that best suits their child.

Based on students failed performance having participated in the “structured English immersion” programs, it is hoped that other states will follow suit as California and reverse the anti-bilingualism legislation in their states.

On another front, having identified the *Guiding Principles for Dual Language Education* original survey as a one of kind instrument in the field of dual language education intended to serve as a tool for self-reflection, planning, and evaluation and recognizing that there is an opportunity for refining the tool compels further federal policy development in the realm of offering grants- such as Race to the Top and Investing in Innovation (i3)—to fund expanding the implementation of programs like dual language that aid in closing the achievement gap and with that sponsoring the development of tools to aid in monitoring and evaluating the program. While the content of the document *Guiding Principles for Dual Language Education* may offer a contribution to the advancement of dual language programs by identifying best practices

and effective practices grounded on research in the field, there still exists an opportunity to refine the survey.

Among other recommendations for policy is for state and local education agencies not to rely just on policy development at the federal level. It is recommended that state and local education agencies either ignite or expand policy development advocating for offering dual language programs. Additionally, it is recommended that local education agencies, such as school districts forge collaboratives with universities to expand development of a broad repertoire of tools to aid in monitoring and evaluating dual language programs. Another recommendation is for school district to forge partnerships with the business sector to fund research to expand the development of such tools. Among some of the additional tools that could further aid in monitoring and evaluating the dual language program are rubrics to aid in assessing biliteracy development. Particularly, there is a need in the area of reading and writing in a 50:50 dual language, two-way setting. In this setting, students are taught paired literacy; students are learning to read and write in both languages (Escamilla et al., 2014). Current tools utilized to measure biliteracy were developed in a monolingual setting, separately for English and Spanish respectively, and are not adequate in measuring simultaneous bilinguals (Escamilla et al., 2014). Progress has been made in developing biliterate reading benchmarks by grade level for English language learners to measure students' biliteracy in Spanish and English by examining a students' reading levels side by side and measuring it holistically (Escamilla et al., 2014). Yet, there still a need for developing biliterate reading benchmarks for counterpart students participating in two-way

classroom—English native speakers. There also exists a need to develop a rubric to measure students' biliteracy progress in the area of writing for English speakers.

### **Implications and Recommendations for Research**

The findings also have implications for the research arena on several fronts. On one front, a short-term implication for research could be to utilize the findings of the study after having conducted principal components analysis and reducing the list of discrete elements to those that critically inform the practice for curriculum, instruction, and/or family and community, to conduct multiple regression to determine which discrete elements explain or predict student achievement. In the case of the study, for example multiple regression could be administered to determine if at least one of the independent variables from the curriculum and instruction strands could explain the variability in the dependent variable, the student achievement. Particularly, utilizing the findings of the study after having conducted principal components analysis, the following four discrete elements could be selected from the curriculum and instruction strands respectively as independent variables having used a Likert rating scale of 1 = not observed; 2 = minimal; 3 = partial; 4 = full; and 5 = exemplary: written curriculum is aligned to the required state standards, the Texas Essential Knowledge and Skills (TEKS); integration of both first and second language development standards; instructional strategies facilitate comprehensible input; and support staff incorporate dual language strategies.

For the dependent variable, student achievement, the English reading achievement of ELLs from the study district as measured by the Stanford, norm-referenced test scores, at the end of fifth grade having participated in the program for at least six consecutive years beginning since Kindergarten would be utilized. Using the English reading scores

for students having participated in the program for at least six consecutive years for the dependent variable is corroborated by a robust body of research in the field ascertaining the high academic achievement of English language learners having participated in well-implemented dual language programs for at least six years. Therefore, the English reading norm-referenced data for students having participated in the program for six consecutive years would be an appropriate measure of student achievement. As an expected norm with quantitative studies, a null and alternative hypothesis would be formulated. The null hypothesis would be that there is no relationship between the independent variables in explaining variability in the dependent variable. The alternative hypothesis would be that at least one of the independent variables is useful in explaining the variability or predicting future values of the dependent variable in this case the student achievement in English reading measured by the Total Reading in the Stanford at the end of fifth grade of English language learners having participated in the dual language program for at least six years. If all of the assumptions for multiple regression are met, then the null hypothesis would be rejected in favor of the alternative hypothesis. The next step would be to examine the results of  $t$ - statistic and  $p$  value to determine if these are statistically significant. In the case of the study, after having met the assumptions for multiple regression, if the following two independent variables are statistically significant, such as written curriculum is aligned to the required state standards, the Texas Essential Knowledge and Skills (TEKS); and instructional strategies facilitate comprehensible input; then these two critical elements would serve to corroborate continuing the implementation of these critical elements or practices since these favorably explain or predict future values relevant to the dependent variable—

student achievement in English reading. If all of the assumptions are not met for multiple regression, then the researcher would fail to reject the null hypothesis. In this particular case, then the four independent variables aforementioned would not aid in explaining or predicting the dependent variable- student achievement. Based on the latter finding, then the practitioners in the field (school leaders, teachers, instructional coaches, and district support personnel) would further assess the effectiveness of the practices that are currently being implemented in the program and consequently examine the quality of the alignment of the written curriculum to the TEKS or the quality of the integration of both first and second language development standards. Recommendations would be made to either adjust or realign the curriculum documents or to conduct multiple regression with the other discrete elements that were part of the original findings from the curriculum and instruction strands respectively, such as taught curriculum is aligned to the required state standards, the TEKS, curriculum is coordinated with support services, infusion of variety of sheltered instruction strategies, and language and content are integrated during instruction, to explain or predict future values relevant to the dependent variable—student achievement—the English reading achievement of English language learners at the end of fifth grade as measured by Stanford who have participated in the dual language program for at least six years.

On another front, as part of the principal components analysis technique, the survey would need to be administered several times to different randomly selected subjects to arrive at reduced list of discrete elements; therefore, the online survey would have to have been administered several times. Per Tabachnick and Fidell (2013), the

researcher begins with a very large number of items administering the items to randomly selected subjects. Tabachnick and Fidell, (2013) posit that following:

As a result of the first factor analysis, items are added and deleted, a second test is devised, and that test is given to another randomly selected group. The process continues until the researcher has a test with numerous items forming several factors that represent the area to be measured. (p. 612)

Additionally, as a result of deconstructing the 103 key points found in the original survey, 245 total items were deduced, yet only 82 items were part of the online survey. The online survey is comprised of three strands: (2) curriculum, (3) instruction, and (6) family and community. While the goal of study is to conduct principal components analysis to arrive at a reduced list of discrete elements that could contribute to successful student outcomes in dual language programming, PCA would need to be conducted utilizing the remaining 162 items for the online survey to reach its maximum potential of measuring all the items. The latter 162 items were derived after deconstructing the other key points belonging to other strands as follows: (1) assessment and accountability, (4) staff quality and professional development, (5) program structure, and (7) support and resources. As previously explained, PCA involves conducting several tests by administering the survey several times to randomly selected subjects each time; therefore, the deconstructed items under each strand would need to undergo several tests before narrowing the list to a reduced number of discrete elements per strand.

There is an additional implication for research at large regarding utilizing principal components analysis in the early stages of research when developing a survey. Particularly, it has benefits for research at large when exploring which discrete elements



should be part of a particular survey. In the case of the study, after conducting principal components analysis with the 82 items comprising the online survey, the items were reduced by about 80% resulting in 17 components. If the trend were to continue, then the original 245 items could have possibly been reduced by 80% which would have reduced the list to 49 items. It also has potential implications for increasing cost effectiveness and time efficiency for practitioners in the field. Among the mounting demands to maximize instructional time, practitioners do not have time to participate in long surveys when the process could have been streamlined to begin with and could still yield the desired outcome. It would be more cost effective and time efficient to take a survey that is comprised of 49 items versus 245 items. Additionally, increasing cost effectiveness and time efficiency is paramount because the input from practitioners in the field is critical to informing the practice. In the case of the study, the online survey that was disseminated contained 82 items for three strands: curriculum, instruction, and family and community since the purpose was to conduct principal components analysis to test the null and alternative hypothesis respectively. While the findings of the study yielded a reduced list of 17 components, it would have been beneficial to the practice having had an opportunity to take a survey including all seven strands. If the original the *Guiding Principles for Dual Language Education* survey would have undergone principal components analysis technique previously and had maintained a similar pattern of reducing the items by 80% as in the study, the participants would have rather taken a survey including all seven strands with 49 items versus one with 82 items addressing only three strands.

Finally, this section includes recommendations for future research relevant to dual language programming. One recommendation would be to conduct principal components analysis at a national level for the seven strands for dual language education with several random sample groups to streamline the survey and increase the validity and reliability of the tool. Another recommendation is to develop tools to aid in monitoring and evaluating program, such as tools for measuring biliteracy development. As mentioned earlier, in 50:50 models, two-way setting, there is a need for additional research in the areas developing tools to measure biliteracy development in reading and writing for English native speakers. There is also a need to examine the long-term effects of high-school graduation and post-secondary education for English language learners having participated in the program relative to those who did not. There is a need for more longitudinal research to determine if English language learners having participated in dual language programs have higher high-school graduation rates relative to those who have not participated in the program (Howard et al., 2003). Another topic for research is to examine college completion rates of English language learners having participated in the program relative to those who have not participated in the program and the extent of using the partner language in one's career (Howard et al., 2003)

### **Conclusion**

In the *Guiding Principles for Dual Language Education* document, renowned scholars in the field of dual language education Howard et al., (2007) cite that “An examination of the investigations reviewed here points to a set of consistent factors that tend to contribute to successful student outcomes in schools in general and dual language programs in particular” (p. 7). Having identified a set of consistent factors that tend to

contribute to successful student outcomes in dual language education serves as the premise for the study. Therefore, after conducting principal components analysis for 82 items for three strands (curriculum, instruction, and family and community), the findings yielded a reduced list of 17 components which would consequently serve as critical elements that contribute to successful student outcomes in dual language education. These critical elements could serve to inform programming and implementation decisions.

Identifying the discrete elements from practitioners in the field at the micro level could further assist to inform the practice, policy development, and research in the field at the macro level. First, practitioners (school leaders, instructional coaches, and district support leaders) can use the findings of the study- the reduced discrete elements to aid in monitoring and evaluating the program. The aim is to set goals and execute changes to improve the implementation of the dual language program increasing student achievement and ultimately aiding in closing the achievement gap for English language learners. At the macro level, policies could be enacted at the federal level that advocate for expanding program offerings as well as funding further research to develop tools that can aid in monitoring and evaluating the program. It is recommended that state and local education agencies either ignite or expand policy development advocating for offering dual language programs. Additionally, it is recommended that local education agencies, such as school districts forge collaboratives with universities to expand development of a broad repertoire of tools to aid in monitoring and evaluating dual language programs. Another recommendation is for school district to forge partnerships with the business sector to fund research to expand the development of such tools.

The findings of the study have implications for research as well. There are implications for research at large in the early stages of developing a survey when determining which elements to include in a particular survey. The findings of the study showed that after conducting principal components analysis, the 82 items were reduced to 17 components. This was a reduction of about 80%. If the trend were to continue, then the original 245 items could have possibly been reduced by 80% which would have reduced the list to 49 items. Additionally, it has potential implications for increasing cost effectiveness and time efficiency for researchers and practitioners in the field. Among the mounting demands to maximize instructional time, practitioners do not have time to participate in long surveys when the process could have been streamlined to begin with and could still yield the desired outcome. It would be more cost effective and time efficient to streamline a survey in the first place for the researchers and the practitioners, than to disseminate a lengthy survey when the desired outcome could have been met with a succinct version.

On another front, there are also implications and recommendations for future research. A short-term implication for research could be to utilize the findings of the study after having conducted principal components analysis and reducing the list of discrete elements to those that critically inform the practice for curriculum; instruction; and/or family and community, to conduct multiple regression to determine which discrete elements explain or predict student achievement. One recommendation is to administer a deconstructed survey for all seven strands and conduct principal components analysis with several randomly selected subjects to aid in increasing the validity and reliability of the tool. Another recommendation is to continue to research the development of tools to

measure biliteracy in the areas of reading and writing. There is also a need to examine the long-term effects of high-school graduation and post-secondary education for English language learners having participated in the program relative to those who did not.

Finally, given the empirical link between adept leadership and improved student learning, it is critical that school leadership embrace shared leadership in aiding to solve problems of practice. Effective school leadership is characterized by a higher level of engagement from a broader array of stakeholders, i.e. teachers, parents, students, community, and district leaders, and provides more opportunities for influence by its constituents (Louis et al., 2010). Effective school leadership is characterized by shared leadership (Louis et al., 2010). School leadership cannot solve the issues of practice in silos. In the case of this study, a need was identified to find a tool that could aid in monitoring and evaluating the dual language program to continue to ensure successful student outcomes. Furthermore, it is recommended that local education agencies, such as school districts forge collaboratives with universities to further the expand the research of development tools to aid in monitoring and evaluating the program as well as partnerships with the business sector to fund these initiatives.

## References

- Adams, W. C. (2010). *Chapter fifteen: Using the internet*. Handbook of Practical Program Evaluation. J. S. Wholey, H. P. Hatry, & K. E. Newcomer (Eds.). San Francisco, CA. Jossey-Bass.
- Beavers, A., Loundsbury, J., Richards, J., Huck, S., Skolits, G., & Esquivel, S. (2013). Practical considerations for using exploratory factor analysis in educational research. *Practical Assessment, Research & Evaluation, 18*(6), 1-13.
- Bryant, F. B., Yarnold, P. (1995). Principal components, and exploratory and confirmatory factor analysis. *Reading and Understanding Multivariate Statistics*. L. G. Grimm & P. R. Yarnold (Eds.). American Psychological Association Books. 99-136.
- Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research, 1*, 245-276.
- Christian, D., Montone, C. L., Lindholm, K. J., & Carranza, I. (1997). *Profiles in two-way immersion education*. McHenry, IL: Center for Applied Linguistics (CAL) & Delta Systems Co., Inc.
- Collier, V., & Thomas, W. (2009). *Educating English learners for a transformed world*. Albuquerque, NM: Dual Language Education of New Mexico- Fuente Press.
- Collier, V., & Thomas, W. (2014). *Creating dual language schools for a transformed world: Administrators speak*. Albuquerque, NM: Dual Language Education of New Mexico-Fuente Press.
- Crawford, J. (1992). *Language loyalties: A source book on the official English controversy*. Chicago, IL: University of Chicago Press.

- Crawford, J. (2000). *At war with diversity: US language policy in an age of anxiety*. Multilingual Matters Ltd. UK: Cromwell Press Ltd.
- Crawford, J. (2006). *Frequently asked questions about official English*. Retrieved from <http://edworkforce.house.gov>
- Crawford, J. (2006). *Official English legislation: Bad for civil rights, bad for America's interests, and even bad for English; Testimony before the House Subcommittee on Education Reform. English as the official language; Hearing before the Subcommittee on Education Reform of the Committee on Education and the Workforce U.S. House of Representatives; One Hundred Ninth Congress; Second Session, July 26, 2006; Serial No. 109-49. U.S. Government Printing Office. Washington, DC. Retrieved from <http://edworkforce.house.gov>*
- Escamilla, K., Hopewell, S., Butvilofsky, S., Soltero-Gonzalez, L., Ruiz-Figueroa, O., and Escamilla, M. (2014). *Biliteracy from the start: Literacy squared in action*. Philadelphia, PA. Caslon, Inc.
- Facts and Figures. (2016). Study District Publication.
- Gall, M., Gall, J., & Borg, W. (2015). *Applying educational research: How to read, do, and use research to solve problems of practice*. New York. Pearson.
- Gorsuch, R. L. (1983). *Factor Analysis* (2<sup>nd</sup> Ed.). Hillsdale, NJ: Erlbaum.
- Hemphill, F., & Vanneman, A. (2011). *Achievement gaps: How Hispanic and White students in public schools perform in mathematics and reading on the National Assessment of Educational Progress*. National Center for Education Statistics; Institute for Education Sciences. Retrieved from <https://nces.ed.gov/nationsreportcard/pubs/studies/2011459.aspx>

- Honig, M.I., Copland, M.A., Rainey, L., Lorton, J.A., & Newton, M. (2010). *Central office transformation for district-wide teaching and learning improvement*. Center for the Study of Teaching and Policy. University of Washington. Retrieved from <http://www.wallacefoundation.org/pages/default.aspx>
- Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika*, 30, 179-185.
- Howard, E. R., Sugarman, J., & Christian, D. (2003). *Trends in two-way immersion education: A review of the research*. Baltimore, MD: Center for Research on the Education of Students Placed At Risk (CRESPAR). Johns Hopkins University.
- Howard, E. R., Sugarman, J., Christian, D., Lindholm-Leary, K. J., & Rogers, D. (2007). *Guiding principles for dual language education* (2nd ed.). Washington, DC: Center for Applied Linguistics.
- Hubbard, R., & Allen, S. J. (1987). An empirical comparison of alternative methods for Principal Component Extraction. *Journal of Business Research*, 15, 173-190.
- Hutcheson, G. D., & Sofroniou, N. (1999). *The Multivariate Social Scientist: Introductory Statistics Using Generalized Linear Models*. CA: Sage Publishing.
- Lindholm-Leary, K. J. (2001). *Dual language education*. Multilingual Matters Ltd. U. K.: Cromwell Press Ltd.
- Linquanti, R., & Cook, H. G. (2013). *Toward a "common definition of English learner:" Guidance for states and state assessment consortia in defining and addressing policy and technical issues and options*. Council of Chief State School Officers (CCSSO). Washington, DC. Retrieved from [http://www.ccsso.org/Documents/2013/Toward\\_a\\_Common\\_Definition\\_2013.pdf](http://www.ccsso.org/Documents/2013/Toward_a_Common_Definition_2013.pdf)



- Louis, K. S., Leithwood, K., Wahlstrom, K., & Anderson, S. (2010). *Investigating links to improved learning: Final report of research findings*. University of Minnesota. Retrieved from <http://www.wallacefoundation.org/pages/default.aspx>
- National Policy Board for Educational Administration. (2015). *Professional standards for educational leaders*. Retrieved from <http://www.npbea.org/>
- Newcomer, K. E., & Triplett, T. (2010). *Chapter twelve: Using surveys*. Handbook of Practical Program Evaluation. J. S. Wholey, H. P. Hatry, & K. E. Newcomer (Eds.). San Francisco, CA: Jossey-Bass.
- Noguera, P., Darling-Hammond, L., & Friedlaender, D. (2015). *Equal opportunity for deeper learning*. Jobs for the Future. Retrieved from <http://www.jff.org/deeperlearning>
- Norušis, M. J. (2005). *SPSS 13.0 Advanced Statistical Procedures Companion*. Upper Saddle River, NJ: Prentice Hall.
- Osborne, J., & Costello, A. (2004). Sample size and subject to item ratio in principal components analysis. *Practical Assessment, Research & Evaluation*, 9(11), 1-9.
- Ovando, C. J., Combs, M. C., & Collier, V. P. (2006). *Bilingual & ESL classrooms teaching in multicultural contexts*. New York, NY: McGraw Hill Higher Education.
- Pallant, J. (2016). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS* (6th ed.). New York, NY: McGraw Hill.
- Pallay, G. (Ed.). (2016). California proposition 58: non-English languages allowed in public education. *Ballotpedia*. Retrieved from

[https://ballotpedia.org/California\\_Proposition\\_58,\\_Non-English\\_Languages\\_Allowed\\_in\\_Public\\_Education\\_\(2016\)](https://ballotpedia.org/California_Proposition_58,_Non-English_Languages_Allowed_in_Public_Education_(2016))

P21 Partnership for 21st Century Learning. (2017). *P21 framework for global education*.

Retrieved from <http://www.P21.org>

Suhr, D. (2006). Exploratory or Confirmatory Factor Analysis. *SAS Users Group International Conference*. SAS Institute, Inc. 1-17.

Tabachnick, B., & Fidell, L. (2013). *Using multivariate statistics*. New York, NY: Pearson.

Texas Education Agency. (2015). *The 2014 comprehensive biennial report on Texas public schools: A Report to the 84th legislature from the Texas Education Agency (TEA), January 2015*. Retrieved from

[http://tea.texas.gov/acctres/comp\\_annual\\_index.html](http://tea.texas.gov/acctres/comp_annual_index.html)

Texas Education Agency. (2016). *Language proficiency assessment committee framework manual*. Retrieved from

<http://programs.esc20.net/users/files/LPAC/2016->

[2017/Framework/01LPAC\\_Framework\\_Manual\\_Accessible\\_2016-2017.pdf](http://programs.esc20.net/users/files/LPAC/2016-2017/Framework/01LPAC_Framework_Manual_Accessible_2016-2017.pdf)

*Texas Education Code (TEC) Chapter 29, Subchapter B. Bilingual Education and Special Language Programs*. (Added by Acts 1995, 2003, 2007).

Thomas, W., & Collier, V. (1997). *School effectiveness for language minority students*. Washington, DC. National Clearinghouse for Bilingual Education.

Thomas, W., & Collier, V. (2002). *A national study of school effectiveness for language minority students' long-term academic achievement*. University of California. CA. Center for Research on Education, Diversity & Excellent.

Thomas, W., & Collier, V. (2012). *Dual language education for a transformed world*.

Albuquerque, NM: Dual Language Education of New Mexico- Fuente Press.

Thompson, B. (2004). *Exploratory and confirmatory factor analysis: Understanding concepts and applications*. Washington, DC. American Psychological Association.

*Title 19 Texas Administrative Code, Chapter 89 adaptations for Special Populations; Subchapter BB. Commissioner's Rules Concerning State Plan for Educating English Language Learners*. (Amended 1996, 2002, 2005, 2007, 2012).

*Title 19 Texas Administrative Code, Chapters 110-130. Texas Essential Knowledge and Skills*. (Amended 1196, 2002, 2005, 2007, 2012).

U. S. Department of Education. (2017a). *Elementary secondary education act*. Retrieved from <http://www.ed.gov/esea>.

U. S. Department of Education. (2017b). *Every student succeeds act*. Retrieved from <http://www.ed.gov/essa>.

U. S. Department of Education. (2017c). *No child left behind*. Retrieved from <http://www.ed.gov/nclb>.

U. S. Department of Justice (DOJ) and U.S. Department of Education (ED). (2015). *Dear colleague letter: English learner students and limited English proficient parents*. Retrieved from <http://www2.ed.gov/about/offices/list/ocr/letters/colleague-el-201501.pdf>

U. S. Department of Justice (DOJ) and U. S. Department of Education (ED). (2015). *U.S. Departments of Education and Justice release Joint Guidance to Ensure English Learner Students Have Equal Access to High-Quality Education*.

Retrieved from <http://www.ed.gov/news/press-releases/us-departments-education-and-justice-release-joint-guidance-ensure-english-learn>

U. S. English, Inc. (2017). <http://www.us-english.org>

Venzant Chambers, T. (2009). "The Receptment Gap" school tracking policies and the fallacy of the "achievement gap." *The Journal of Negro Education*, 78(4), 417-431.

Wallace Foundation (2010). *Knowledge in brief: Findings you can use from new Wallace research*. Retrieved from [www.wallacefoundation.org](http://www.wallacefoundation.org)

Zwick, W. R., & Velicer, W. F. (1986). Comparison of five rules for determining the number of components to retain. *Psychological Bulletin*, 99, 432-442.