

**INVESTIGATING TEACHING STRATEGY DIFFERENCES IN DUAL  
ONE-WAY AND TWO-WAY PROGRAMS IN BILINGUAL  
CLASSROOMS: A CASE STUDY**

An Undergraduate Research Scholars Thesis

by

SILVIA A. GARZA

Submitted to the Undergraduate Research Scholars program  
Texas A&M University  
in partial fulfillment of the requirements for the designation as an

UNDERGRADUATE RESEARCH SCHOLAR

Approved by  
Research Advisor:

Dr. Beverly Irby

May 2016

Major: Bilingual Education

# TABLE OF CONTENTS

	Page
ABSTRACT.....	1
DEDICATION .....	3
ACKNOWLEDGEMENTS .....	4
CHAPTER	
I    INTRODUCTION .....	5
Dual language theoretical framework.....	7
Dual language program controversy.....	8
II   METHODS .....	10
III  RESULTS .....	13
IV  CONCLUSION.....	23
REFERENCES .....	24
APPENDIX A.....	26

## **ABSTRACT**

Investigating Teaching Strategy Differences in Dual One-Way and Two-Way Programs in Bilingual Classrooms: A Case Study

Silvia A. Garza  
Department of Bilingual Education  
Texas A&M University

Research Advisor: Dr. Beverly Irby  
Department of Educational Administration and Human Resources Development

The general purpose of this research is to investigate the most effective teaching methods and strategies that support children's language proficiency in Spanish and English in a central Texas public school district. A secondary purpose is to analyze surveys that measure teachers' perspectives regarding the strategies used in their personal experience as bilingual educators in dual language programs.

There are various strategies and methods that bilingual teachers use to help early elementary students succeed in language proficiency; early literacy skills are the fundamentals on which reading proficiency develops (Gratch, 1992). Every teacher adapts different strategies that work best for the students according to their needs; therefore it might be difficult to recognize the best method. By investigating specific surveys, and assessment results, I can have quantitative data that can point to which method gives the best results for students to succeed in Spanish and English language proficiency. I will also be able to analyze and report qualitative, descriptive data about each program type within the schools and the most successful methods that are being used according to teachers' perspective. This research will provide valuable data about the techniques that are being used in today's school programs and the impact they have to the early

elementary students. It will also provide a specific number of the most successful strategies from current teachers perspective that work best for bilingual learners that can be implemented by future teachers.

## **DEDICATION**

In great appreciation this is dedicated to all my family, specially my parents and brothers. I want to thank my father, Javier, for being the support of my family, for encouraging me every day to try my best and to inspire me in achieving all my goals in life. I want to thank my mother, Silvia, who gives me the strength to try my best in everything I do every day. She is my role model, and the person who has never lost faith in me, and my capability of going beyond my dreams. I want to thank her for all her love, and positivity, which is what moves me every day to keep trying and never give up. My brothers, Javier and Alejandro, thank you for all the moments and smiles we have shared, and for helping me in the moments when I have needed you all the most. I want to thank my grandparents, Rosendo, Gladys, Socorro y Jose Trinidad, who saw me grow as a person and who always encouraged me to follow my dreams and to do everything with love. More than anything I want to thank God for this opportunity, I feel blessed to be part of this beautiful family, and I am very grateful for everything that I have. I love you all with all my heart.

## **ACKNOWLEDGMENTS**

I would like to sincerely thank Dr. Irby for guiding me through all the process of writing this thesis. Thank you for giving me the motivation to keep working hard and for mentoring me in this journey. I am very grateful for all your support and your dedication.

# **CHAPTER I**

## **INTRODUCTION**

According to the National Center for Education Statistics (NCES), the percentage of public school students in the United States who were English language learners (ELL) has been increasing. In the 2002-03 school year it was 8.7%, in 2011-12 it was 9.1%, and in 2012–13 it was 9.2%. Since the number of students have been increasing, it is necessary to analyze the teaching strategies being implemented in the classrooms according to the teachers' perspective that work best. Strategies used by teachers are important because it impacts the way students learn. Those preparing to become pre-kindergarten to twelfth grade (PK-12) teachers require a comprehensive understanding of information literacy to guide their own knowledge creation activities that will ultimately affect their future students (Lindholm-Leary, 2012). Imagine being expected to learn everything in an unfamiliar language. An individual might have a wealth of knowledge, but cannot express that knowledge. It is a teacher's job to help Spanish-speaking students transfer their knowledge from their home language to English and feel safe and strong expressing themselves (Upczak-Garcia, 2012). The Dual Language and Transitional Bilingual programs are some of the most effective programs used in the Texas districts to allow greater language proficiency to all English language learner students.

The dual language program is designed to teach students half of the learning content material in the primary language, and the other half in the second language. Students might have different types of dual language programs. They might have it one week Spanish and the other in English, one day Spanish and the other day English or some subjects in one language and the other

subjects on the other depending on their district. On the other hand, the transitional bilingual program uses both languages in the classroom during a transitional period to support learners whose home language is not English. As the students learn English, the primary language is gradually phased out until the student is mainstreamed into English-only classes (Murphy, 2014).

There have always been quite a number of strategies and methods used to deliver material to students, but with time, new generations have required greater innovation, and teachers have required a better understanding of how to deliver the material most effectively allowing students a greater understanding and better academic development. It is useful to explore bilingual Instructional strategies for teaching emergent bilingual students rather than assuming that monolingual instructional strategies are inherently superior (Cummins, 2014). Learning strategies are said to be the principal influence on learning a second language, whereas inherent development and experiential factor are primarily responsible for first language learning (O'Malley, Chamot, Stewner-Manzanares, Russo, & Küpper, 1985). In my research, I produced a case study on the best strategies being used in a central Texas school district, and answered the following questions: (a) What are the different strategies used by teachers in the dual programs in a central Texas school district to achieve bilingual language proficiency?, (b) According to the teacher's perspective, what are the most successful strategies according to the response of the students?, and (c) What is the impact on the second language learners according to the results of their academic development on standardized tests in a central Texas school district (which will remain anonymous—data will be collected from the state open database).

Objective 1: To determine the different strategies used by teachers in the dual programs to achieve bilingual language proficiency (Hypothesis is stated as a Research Question 1, since this is Qualitative Research).

Objective 2: To define differences between/among all the types of dual language programs (Hypothesis is stated as a Research Question 2, since this is Qualitative Research). This will include defining the differences of the dual programs and comparing in what program teachers feel more comfortable working with. It will also mention the most efficient and preferred program of bilingual education by the teachers, either dual or transitional.

### **Dual language theoretical framework**

In the United States, the dual language program started as a model of the Canadian-French immersion program that demonstrated satisfactory academic results. The Dual language program is also known as the “Two-way immersion program,” “Bilingual immersion” or “Spanish immersion” depending on the district being used (Kim, Hutchison, & Winsler, 2015). These programs involve combining the student native language and English in the same classroom throughout the day. This program benefits other language speakers, in the United States mostly Spanish speakers to learn English and native English speakers to learn a second language. Students must enroll for at least five years in this program and most of them run from kindergarten to fifth or sixth grade, depending on the district (Charbonneau, Gomez, Waite, & Vang, 2009).

The two most common models of dual language programs are the '90:10' and '50:50' (Lindholm-Leary, 2012). The 90:10 model is also known as "full immersion" where the students from kindergarten to second grade learn 90% of the material in their native language and 10% in English. From third grade on, the percentage of English increases yearly until students can reach a 50:50 balance of the language. On the other hand, in a 50:50 model, also known as "partial immersion," students receive from kindergarten --half of the material in English and the other half in their native language. Due to its efficacy and success with students, the numbers of dual language programs have been increasing drastically since the 1980s due to its efficacy and success with students (Kim et al., 2015).

Numerous studies have been conducted over the dual language programs, its advantages, and its benefits. It has been demonstrated that bilingual education has a positive effect on students (Kim et al., 2015). The Dual Language 90:10 model is the most efficient and beneficial for students according to the studied data.

### **Dual language program controversy**

The United States has more minority languages than what the dual language programs can address and offer to students. Most of the districts that offer these programs are geographically located in places where majority of immigrants or other native language speakers live; in the case of Spanish, it is California and Texas. This means that not every student can enroll in dual language programs and benefit from it. There are also many factors to take into consideration when we talk about a successful dual program. Some of the factors include having the appropriate textbooks, and bilingual material, which might be hard to find. Other important

factors include parent and community involvement, community environment, and good quality of social behavior in the classroom. It is crucial for the students to acquire their native language proficiency first and develop their second language at the same time. According to past research, the most important factor is the lack of qualified teachers (Kim et al., 2015). To solve this problem, the United States started a program where teachers from the other native languages countries were recruited to work for several schools. In general, the dual programs have showed to be great for students and especially English language learners, but there is still some space for future improvement.

## **CHAPTER II**

### **METHODS**

The purpose of this study was to determine the most effective teaching methods and strategies that support children's language proficiency in Spanish and English in a central Texas public school district and to analyze surveys that measure teachers' perspectives regarding the strategies used in their personal experience as bilingual educators in dual language programs. I used qualitative research methods and descriptive statistics to analyze the data in my case study. This is a case study inclusive of an issue or topic from the everyday knowledge. Within the study, I answered address two objectives and three research questions by conducting surveys with teachers about the dual language programs, and by reviewing statistical information from a central Texas school district (The statistical test results for the state test, STARR, are open access on the Texas Education Agency AEIS/TAPR website.) I reviewed the scores of standardized testing available to the public online from students in third through fifth grade of the students in the bilingual programs in the district, and compared schools in the district for the 2015 examination. I was advised by the district which school had engaged in dual language the longest, so I was able to see the difference in test scores among all the bilingual campuses and compare those against the district scores in reading and math. The scores are reported in terms of percent passing (met or exceeded progress) for all grade levels (only third through fifth grade are assessed). I analyzed qualitative data in the case by describing the context and the programs overall. The AEIS/TAPR data were analyzed and placed in figures for comparison over time, and I provided tables with the most effective strategies according to the teacher's perspectives and the results of the students in test scores.

All elementary bilingual teachers in a central Texas school district were asked to participate in a voluntary survey completed through Qualtrics. I included the following survey questions: (a) I teach in transitional bilingual education, yes or no, (b) I teach in dual language education, yes, or no, (c) My dual language is a one way or two way?, (d) What are three top strategies (please describe them) you use to teach reading (either dual language education one-way or two-way- depending on their placement)?, and (e) What are three top strategies (please describe them) you use to teach math (either dual language education one-way or two-way- depending on their placement)? The Research Goal was to gather data from bilingual teachers in two types of second language programs in a central Texas school district to (a) determine the different strategies used by teachers in the dual programs to achieve bilingual language proficiency, (b) define differences between/among all the types of instructional activities/strategies used in dual language programs, (c) determine specific strategies that teachers consider their most successful strategies in each type, and (d) compare the impact on the second language learners by school campuses holistically, not individually, according to the results of their academic development on the state exam in a central Texas school district. Scores were obtained from the public database kept by the Texas Education Agency and which is available online from the AEIS/TAPR websites (Agency., 08 Apr. 2016.).

The central Texas school district was a chosen sample site, because, according to the Texas Education Agency (Agency., 08 Apr. 2016.) open access data, it is a district with a high number of Hispanic students enrolled in bilingual (dual language) programs. According to the Texas Education Agency, 55.0% of students in this district are Hispanic, 23.9% are White, and 18.9% are African American. 22.3% are English language learners and 23% of students are in a

Bilingual/ESL Education program.

## CHAPTER III

### RESULTS

The main objective of this research was to study the teacher's perspective of best instructional strategies included in the dual language programs in a central Texas school district as stated previously. Texas is one of the states with more bilingual programs need due to its proximity to the border with Mexico. According to an article written based on perspectives from the education in El Paso TX, a teacher expresses the following information: "In most districts, students are moved out of bilingual education just as soon as they learn rudimentary English," said Elena Izquierdo, a professor of bilingual education at the University of Texas at El Paso. Dual language takes longer, in part because so much time is devoted to Spanish grammar and literacy. But it pays off down the road. Learning their first language first, in this case Spanish, helps the students develop the cognitive skills they need to learn English well (Blakeslee, 2009). Her point of view of bilingual education to or community is very accurate to what other studies have shown. It is crucial that the students are able to have full proficiency of their native language, that way they can master the second language, in this case, English and this is the main goal of dual language programs, which is why they are very successful. "There was something amazing about sitting in the back of Garcia's classroom and watching a group of confident and fully engaged young men and women tackling a college-level science course, knowing that most of them had started kindergarten with the enormous disadvantage of not speaking English" (Blakeslee, 2009). It is amazing to see how a student can acquire two languages. The dual language program 90:10 has been proven to be the most effective model in achieving the kind of success as mentioned in Mr. Garcia's classroom. By developing proficient first language skills, it is easier for students to acquire their second language.

It is very important to take a close look to what the teachers in the central Texas school district are doing to fulfill the needs of bilingual students and allow them to develop in two languages academically. Figure 1 provides information about the type of bilingual program in which the teachers who participated in the questionnaire work. 62% answered to work in a dual education program. Figure 2 demonstrates that of those teachers who participated, 58% work in the dual one-way program, and 42% in the dual two-way program.

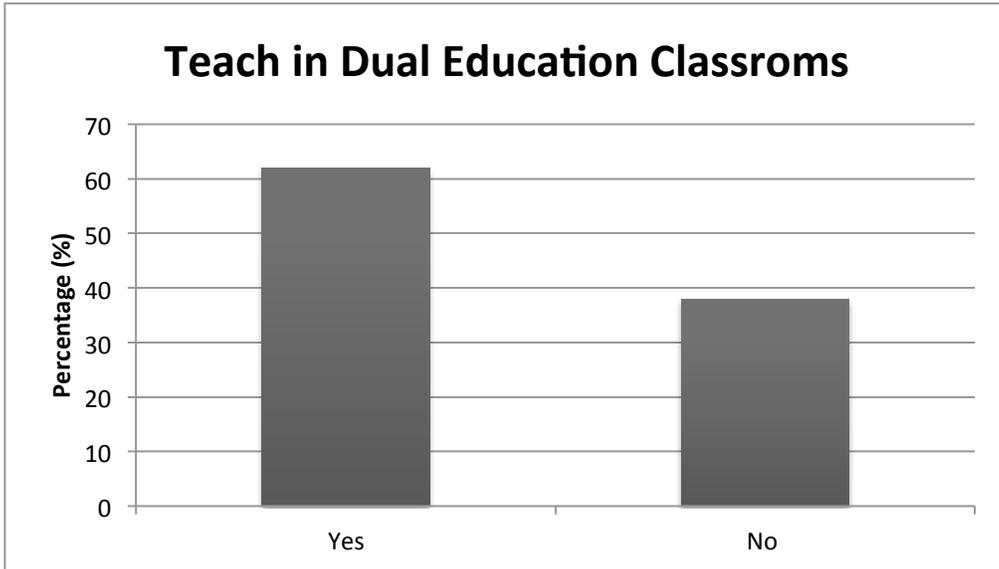


Figure 1. Teachers in the dual education program classrooms.

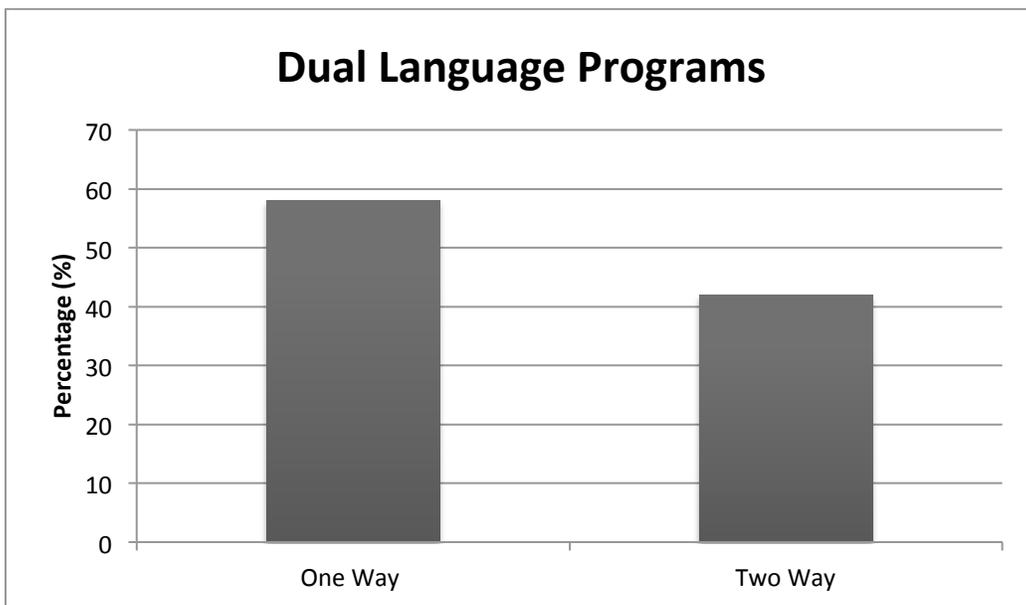


Figure 2. Teachers in either one-way or two-way dual language programs.

After analyzing the results of 13 teachers who participated on the survey, Table 1 contains a summary of the list of the most effective strategies according to their perspective used for teaching reading in bilingual classrooms. The actual results could be found in the Appendix Table A1.

Table 1  
*Reading Strategies for Dual Language Education*

<b>Reading Strategies</b>	<b>Frequency of Responses</b>
Think Pair share	1
Reciprocal Teaching	1
Book Walk	1
Questioning/Predicting	1
Highlighting	1
Visualizing/Connecting	1
*Bilingual Partners	2
Sentence Stems	1
*Spanish Cognates	2
ACE Strategies	1
*Guided Reading	3
Breaking Down SE's	1
*Small Groups	4
One on One Conferences	1
*Individual Sound of Words	4
Segmenting/Blending Activities	1
"Ticket Out the Door"	1
Differentiated Instruction	1
Rhyming Words	1
Estrellita Intervention	1
*Canciones y Cuentos	3
Literacy Stations	1
Accelerated Reading with Computers	1

Note: \* denotes top strategies noted

The results demonstrate that some of the best strategies to help bilingual students generally in their academic development are to use cooperative learning strategies. Think Pair Share, is when students think to themselves about an answer, share it with a partner, and then share it with the

classroom. Another strategy is Bilingual Pairs, where ELL and native English speakers are paired and interact continuously. Small groups strategy is where students have the opportunity to collaborate with each other and guide their learning. One on One Conferences allows for the teachers to approach the students and have a conversation about their academic progress and future educational goals. Guided Reading Groups are an excellent strategy to guide the students' understanding of how to read a text and comprehend the steps of reading. The Book Walk strategy is great to help bilingual students make connections, activate prior knowledge and introduce new vocabulary to their understanding by showing them the pictures from the book, reviewing the vocabulary, and making predictions before reading the text.

Questioning, predicting, visualizing, and connecting are effective strategies to help students highlight the important facts in stories and acquire a better and full understanding of what they are reading. According to the results, the "ACE Strategy" is a great tool to teach students on how to read and make sense of what they are reading. First, they have to answer the question, and then cite from the text something that backs up their answer and at the end, they are required to expand and explain their connections and reasoning. Second-language learning has shown that students must engage in a great deal of oral interaction, jointly negotiating, meaning, and solving problems in order to reach high levels of proficiency. . Cooperative learning provided opportunities for students to work together to construct meaning and share their understandings about what they are learning in their classrooms (Calder, xf, n, Hertz-Lazarowitz, & Slavin, 1998).

Reciprocal teaching is when the students are capable of internalizing the knowledge and explaining it to their peers in their own words. Reciprocal teaching, with the assistance of the teacher and/or more knowledgeable peers, provide an environment in which students become increasingly proficient at applying comprehension strategies while reading text passages (Klingner & Vaughn, 1996). Highlighting text is a great way to teach the students the steps of reading and to engage them more in the reading process and vocabulary knowledge as well as sentence stems where students are given the first words of a sentence and they are expected to fill it out creatively with their own choices of words. The teaching of cognates to bolster the vocabulary of Latino ELs because of their similarity to Spanish words has been greatly recommended by educators (Montelongo & Hernández, 2013). For that reason, the usage of cognates in a bilingual classroom is considered one of the best strategies, it allows the students to make connections with their prior knowledge and make sense of new words. Breaking down sentences is very similar to the use of cognates because it allows the students to stop and carefully think of what each word in a sentence means and what is the message of the sentence once they can put together the definitions of all the words.

The Individual sound of words or word building and the strategies that evolve from it such as rhyming, have the potential to encourage students become better decoders, and as a result, better readers, and to get to the ultimate aim of having students applying these strategies on their own (Gunning, 1995). The Estrellita intervention is mainly used to help Spanish-speaking student develop a good foundation of their language and serves as a transition to English by guided reading and activities. The usage of “Canciones y Cuentos”, literacy stations, and accelerated reading in computers, are strategies that provide opportunities to students to participate in the

development of their academic language. The three strategies focus on reading to the students or having activities that motivate them to read and work individually or in pairs.

The results demonstrate that direct instruction and individual instruction are crucial for student’s development of their second language. Talking about each students reading and writing goals individually and assessing them is the key to a giving a better instruction by the needs of each student.

Table 2 lists a summary of the top strategies according to the participants’ perspective on teaching math in the Dual Language programs. The actual responses could be found in the Appendix Table A2. The results demonstrate that some of the strategies repeat in reading and math due to the importance of cooperative learning and differentiated instruction. The most important thing to take into account for math is the use of images and visuals for the students.

Table 2  
*Math Strategies for Dual Language Education*

<b>Math Strategies</b>	<b>Frequency of Responses</b>
Read/Listen instructions carefully	1
*Manipulative	3
*Modeling	2
Anchor Charts	1
ACE Strategies	1
*Bilingual Pairs	3
Scaffolding/ Differentiated Instruction	1
*Images	2
Pre-teach Vocabulary	1
Translate Instructions	1
*Main Concepts	2
*Small Group Instruction	2
Counting to 30 in class, playground and circle	1
Math problems with Students’ Names	1

Note: \* denotes top strategies noted

The process of developing internal representations of mathematical ideas is one of the most important in order to achieve mathematical understanding. In fact, one of the five process standards designated by the NCTM is representation (Puchner, Taylor, O'Donnell, & Fick, 2008). Manipulatives, anchor charts, and modeling are great strategies to implement the representation factor into a math concept. Visuals allow the students to create a mental image and to connect with real life problems that can be solved with the newly acquired knowledge. Strategies such as teaching the students to read and listen carefully to the math instructions, translate instructions, and emphasize on teaching the main concepts of the lessons are very important for bilingual students since they are barely starting to get familiarized with the academic language. Pre-teaching vocabulary is a great strategy that helps the students to have an idea of what the lecture is going to be about and to understand what is it that they are looking for in the math problems. It is another way of incorporating the academic language. Differentiated instruction is crucial for developing good classroom environment. The strategy of including student's names in math problems, and counting to 30 in different settings, are examples of effective ways of incorporating the students in the lessons and engaging them in math.

Table 3 summarizes the strategies with the most frequent responses from the teachers in both reading and math subjects. The two strategies that according to the results of the participants' perspective that work best in their bilingual classrooms were small group instruction, and bilingual pairs.

Table 3  
*General strategies for Dual Language Education*

<b>General Strategies</b>	<b>Frequency of Responses</b>
Small Group Instruction	6
Bilingual Pairs	5

Children need to hear language in rich, meaningful context to help them relate to what they are learning with their prior experience, that way they can develop a first or second language. As dual language programs increase in number, teachers are changing the way they teach, based on the characteristics of the children in the class and the goals of the program (Alanís, 2013). Bilingual pairs help students practice their natural conversations as they develop academic concepts. Small group instruction provides the teachers with the opportunity to deal with a diverse range of students' needs and to present enrichment material. It allows students to work together to develop academic content, and the opportunity for students to develop social skills (Good, Grouws, & Mason, 1990). Small group instruction is the strategy that was used with most frequency by the participants the central Texas school district.

To answer objective two and research question three, I analyzed the scores across the district at schools. The results demonstrated that ELL scores met or exceeded progress and compared to the district's overall scores at the elementary level, the ELLs appear to be doing better in English testing. However, the scores are still below 90% passing at that level. One school has a higher score as indicated in the figure, and that school has had dual language longer than any other school in the district. Figure 3 shows the scores on STARR for elementary schools in the district serving English learners and indicates that ELLs are doing better across campuses that engage in dual language education as compared to the district. The graph shows differences in a school that has had dual language for at least 15 years, which is the one that has had highest test results in reading and in math.

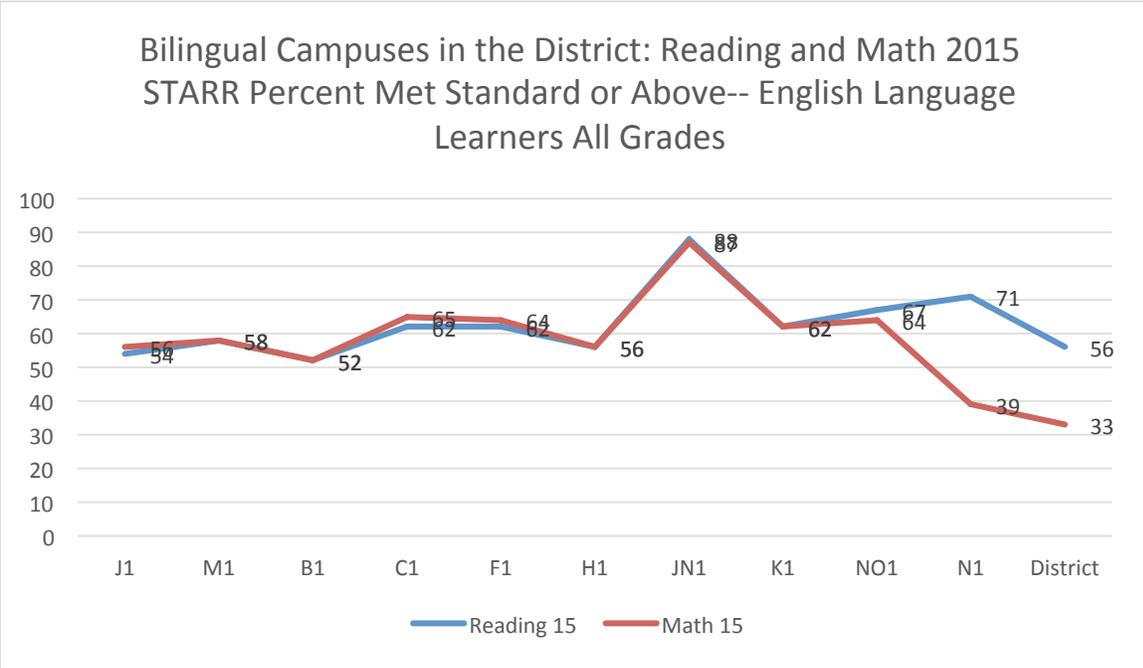


Figure 3. Scores on STARR for elementary schools in the district serving English learners.

## **CHAPTER IV**

### **CONCLUSION**

In my investigation, I was able to determine a list of the most-used instructional strategies used by bilingual/dual language teachers in a central Texas school district according to their perspective. After analyzing the results of the study, the two most frequent strategies used for bilingual students in the classrooms were found. In general, cooperative learning such as bilingual pairs and small group instruction is the foundation of the strategies and were reported by the teachers be the most effective way to teach bilingual students. Cooperative learning involves students working in groups or pairs, and previous research has proven that is a good technique for ELLs to learn a second (Johnson, Johnson, Smith, & Center, 1989) language and to feel identified with their language. (Johnson et al., 1989)

In my research, I determined that ELL students are achieving, but must do better in their state assessments in this district. I also determined that a school that had been engaged in dual language education for a lengthy period of time had ELLs who outperformed their peer at other campuses with fewer years of engagement in dual language education.

I recommend further study in this area of dual language education. For example, a study with more teachers across multiple districts to determine the best strategies for teaching ELLs would be advantageous. Additionally, further analysis of the test data that is available from the state would be advisable.

## REFERENCES

- Agency., T. T. E. (08 Apr. 2016.). from <http://tea.texas.gov/>
- Alanís, I. (2013). Where's Your Partner? Pairing Bilingual Learners in Preschool and Primary Grade Dual Language Classrooms. *YC Young Children*, 68(1), 42.
- Blakeslee, N. (2009). Dream of a Common Language. *Texas Monthly*, 37(9), 108-149.
- Calder, xf, n, M., Hertz-Lazarowitz, R., & Slavin, R. (1998). Effects of Bilingual Cooperative Integrated Reading and Composition on Students Making the Transition from Spanish to English Reading. *The Elementary School Journal*, 99(2), 153-165.
- Charbonneau, S., Gomez, D., Waite, D., & Vang, K. (2009). Student achievement in California two-way immersion programs. *Language Magazine*, 9(2), 30-35.
- Cummins, J. (2014). Rethinking pedagogical assumptions in Canadian French immersion programs. *Journal of Immersion and Content-Based Language Education*, 2(1), 3-22.
- Good, T. L., Grouws, D. A., & Mason, D. A. (1990). Teachers' Beliefs about Small-Group Instruction in Elementary School Mathematics. *Journal for Research in Mathematics Education*, 21(1), 2-15. doi: 10.2307/749453
- Gratch, B. (1992). Information Retrieval and Evaluation Skills for Education Students.
- Gunning, T. G. (1995). Word Building: A Strategic Approach to the Teaching of Phonics. *The Reading Teacher*, 48(6), 484-488.
- Johnson, D. W., Johnson, R. T., Smith, K. A., & Center, C. L. (1989). *Cooperative learning*: Interaction Book Company.
- Kim, Y. K., Hutchison, L. A., & Winsler, A. (2015). Bilingual education in the United States: an historical overview and examination of two-way immersion. *Educational Review*, 67(2), 236-252.

- Klingner, J. K., & Vaughn, S. (1996). Reciprocal Teaching of Reading Comprehension Strategies for Students with Learning Disabilities Who Use English as a Second Language. *The Elementary School Journal*, 96(3), 275-293.
- Lindholm-Leary, K. (2012). Success and challenges in dual language education. *Theory into Practice*, 51(4), 256-262.
- Montelongo, J. A. J. N. E., & Hernández, A. C. A. N. E. (2013). The Teachers' Choices Cognate Database for K-3 Teachers of Latino English Learners. *Reading Teacher*, 67(3), 187-192. doi: 10.1002/TRTR.1194
- Murphy, A. F. (2014). The Effect of Dual-Language and Transitional-Bilingual Education Instructional Models on Spanish Proficiency for English Language Learners. *Bilingual Research Journal*, 37(2), 182-194.
- O'Malley, J. M., Chamot, A. U., Stewner-Manzanares, G., Russo, R. P., & Küpper, L. (1985). Learning strategy applications with students of English as a second language. *TESOL quarterly*, 19(3), 557-584.
- Puchner, L., Taylor, A., O'Donnell, B., & Fick, K. (2008). Teacher learning and mathematics manipulatives: A collective case study about teacher use of manipulatives in elementary and middle school mathematics lessons. *School Science and Mathematics*, 108(7), 313-325.
- Upczak-Garcia, A. (2012). Cross-Discipline Teaching for English Learners. *Educational Leadership*, 69.

## APPENDIX A

Table A1. *Dual Language teacher's perspective in best strategies used in their classrooms in Reading*

Text Response
1. Think Pair Share - this enables students to have some wait time to think about the proposed question. They are allowed to share it with a partner before it is shared out with the group. 2. Reciprocal Teaching- Reciprocal teaching refers to an instructional activity that takes place in the form of a dialogue between teachers and students regarding segments of text. The dialogue is structured by the use of four strategies: summarizing, question generating, clarifying, and predicting. The teacher and students take turns assuming the role of teacher in leading this dialogue. 3. Book Walk Use this strategy to activate prior knowledge, introduce vocabulary and create a purpose for reading. 1. Show students pictures in the sequence in which they occur in a story. 2. Ask students to identify what they see happening. 3. Encourage students to ask questions when it is unclear what is happening or if certain words are difficult to express. 4. Have students make connections to what they see happening in the story. 5. Read the story together.
Reading- questioning /predicting to improve comprehension Highlighting important facts Visualizing/Connecting facts to own experiences
Bilingual partners: pair the students up into partners (ELL and Native English Speaker) to help each other out. Sentence stems "I predict _____ because _____" (in Spanish) Spanish Cognates: what does this word look like? What do you think it means?
ACE strategies, guided reading groups, studying and breaking down the SE's to really understand the concepts that I need to teach for the kids.
Small groups- by reading level whole group lesson- all students one on one conferences- we talk about their reading and writing goals and assess students
Individual sounds to create syllables to later blend to read a word based on basal reading curriculum, segmenting and blending activities quickly when transitioning locations around school, "ticket out the door" strategy, scaffolding, differentiated instruction
Sounding out words. Have children try to read the word by matching the sign to the corresponding sound. Spelling patterns. Have children try to identify spelling patterns such as words that end with -tion, for example. Rhyming words. Have children match rhyming words.
-Estrellita intervention style with syllables with the same vowel (after they learn all letters and sounds based on the estrellita chant). Canciones y Cuentos sequence of syllables showing students all of the vowels with the consonants. -Literacy Stations that spiral letter/sounds and syllables activities with both pictures and non picture stations -Guided reading instruction based on students' academic level and needs in reading
Guided reading Games Small group instruction
Letter sounds Syllable clapping Interactive reading children's books content related
1. Small group instruction according to students' levels. 2. Reading novels with entire class (sometimes in English and sometimes in Spanish). 3. Accelerated reading using computers.
-Language Partners -Wait Time -Small Groups

Table A2: *Dual Language teacher's perspective in best strategies used in their classrooms in Math*

Text Response
I am not a math teacher.
Instructing the students to read/listen carefully for instructions/explanations. Use of manipulatives and extensive teacher /modeling activities. Practice/Review/feedback/practice/practice....
Anchor charts. Dual language Anchor charts. Sentence stems: "I know the time is _____ because _____" (in Spanish) Spanish cognates.
ACE strategies, math groups, studying and breaking down the SE's to really understand the concepts that I need to teach for the kids.
Bilingual pairs- students are paired with one English and one Spanish speaker small groupings- mixed groups by levels hands on- students use manipulatives during lessons
Ample amount of images when teaching math in English to support ELLs, begin or introduce topic before in native language so students are better prepared when teaching lesson in English, the use of manipulatives on a daily basis to teach students and explain, especially a topic in English, scaffolding, differentiated instruction
Pre-teach vocabulary. I give a mini-lesson on vocabulary for every math lesson. Translate instructions. I usually give instructions for math in both English and Spanish. Write down main concepts. I write down the main concepts to be used during the lesson on the board in both English and Spanish.
-Bilingual pairs in math stations (Pair High English students with a high Spanish student) grouped by ability levels. -Both co teachers have the same math stations to provide consistent expectations in the math stations. Math stations spiral important concepts we teach during the year such as number sense, composing and decomposing, number sequence, comparing numbers, graphing, greater or less. -Small group instructions based on students' needs. t
Counting to 30 in large groups Counting at playground Counting in circle
1. Using real math world problems using students' names. 2. Using cubes strategy. Circle all numbers, Underline the questions, Box any math action words Evaluate (what steps go I take) Solve and check 3. Practice everyday in the classroom using manipulatives, pictures and visuals.
-Language Partners -Wait Time -Small Groups