

Full Length Research Paper

An Academic Comparison of Fourth-Grade Students Taught in English-Only Classrooms and Spanish-Only Classrooms in the Same District

Tracy Vik, David De Jong, Karen Card, & Sandy Henry

Tracy Vik: Irving Elementary, Tracy.Vik@k12.sd.us

David De Jong: Division of Educational Leadership, The University of South Dakota, David.DeJong@usd.edu

Kristine Reed: Division of Educational Leadership, The University of South Dakota, Kristine.Reed@usd.edu

Karen Card, The Division of Educational Leadership, The University of South Dakota, Karen.Card@usd.edu

Sandra Henry: Former Curriculum Leader, sandyhenry2010@gmail.com

Accepted July 20, 2020

Language immersion programs are becoming more available as a form of school choice in both private and public education in the United States and beyond. While there is research on the benefits of immersion education regarding overall intelligence, there is still much skepticism as to why parents would place their child in an immersion program vs. a traditional program where all academics are taught in English. This study presents the data from two schools in the same school district in a Midwest state that took the bold move to create a stand-alone one-way Spanish full immersion school. This employed a quantitative approach, which used descriptive statistics to answer the research questions by comparing the two groups of students' scores to determine what differences in achievement existed between students taught in a traditional program in English, and those taught in a Spanish immersion program. The analysis shows that students educated in the immersion program scored statistically better than their similarly situated peers on the Smarter Balanced Assessment in mathematics and the Measure of Academic Progress in mathematics and reading. The analysis also showed the students educated in the immersion program performed better than their similarly situated peers on the Smarter Balanced Assessment in English language arts and the ABC District Writing Assessment, but statistical significance was not found. This finding may give parents the confidence they need to choose Spanish immersion for their child(ren) if this is an option in their district. While this study is based upon a one-way full immersion program, the findings may also apply to dual and two-way immersion programs where similar results may be achieved for English Language Learners educated in their native language as well as in English.

Keywords: Spanish immersion; fourth grade; academics

The world today is vastly different from the world in which many Americans grew up. Globalization is changing how we work, how we communicate, and how we live. The growing global interdependence that characterizes our time calls for a generation of individuals who can engage in effective global problem-solving and participate simultaneously in local, national, and global civic life (Mansilla & Jackson, 2011; Van Roekel, 2010). Preparing our students to participate fully in today's and tomorrow's world demands that we nurture their global competence (Jacobs, 2013; Mansilla & Jackson, 2011; Van Roekel, 2010).

Educators must provide academic support and programs that give students a competitive edge (National Education Association, 2012). They must also understand the importance of global competence and how specific programs can factor into that process (Mansilla & Jackson, 2011). This new reality

helps us more clearly define the role that education plays in preparing all students for success in an interconnected world. Schools strive to produce students that have a functional awareness of the world--its cultures, languages, and how its economic, environmental and social systems work (Jackson, 2016). Society now faces a critical imperative to prepare all students for work and civic roles in an environment where success increasingly requires the ability to compete, connect, and cooperate on an international scale (National Education Association, 2012). Educators today must rise to the challenge of preparing students for this new world. According to the Asia Society (Mansilla & Jackson, 2011),

The educated American of the twenty-first century will need to be conversant with at least one language in addition to his or her native language, and knowledgeable about other countries,

other cultures, and the international dimensions of issues critical to the lives of all Americans. (p. 36)

Second language acquisition stands out as a key component for developing a globally competent student (Jacobs, 2013; Mansilla, & Jackson, 2011). Creating bilingual, multicultural thinkers and learners is appealing to many parents; however, the apprehension of their child lagging behind their same age peers on standardized English tests is of great concern (Arce, 2010; Bialystok, Craik, & Luk, 2012).

Need for Immersion Education

The world in which we live is changing at a significant pace. Children growing up in the 21st-century are required to have an awareness and understanding of the world far beyond their schoolyard or community (Crockett, 2015). Children who learn a foreign language at an early age develop a deeper understanding of their own culture as well as the cultures of others (Alvear, 2019; Brannon, 2019). Some evidence suggests they are more creative and have increased stamina to solve complex problems (Brannon, 2019). But even more important, Americans fluent in other languages enhance our economic competitiveness abroad, improve global communication, and maintain our political and security interests (Met, 1998).

According to Ingold and Wang (2010), world language education in the United States is inadequate and trails behind in preparing students with the skills needed to be globally competent. The U.S. does not offer equitable opportunity and access for world language learning for all students. Of those programs offered in schools, many start too late in a child's education to allow students to build proficiency in the second language. For students to be prepared to compete in a globalized world, educators must produce innovative, creative, and entrepreneurial citizens (National Education Association, 2012). Students must be equipped to work with people from various walks of life, across various fields of expertise, linguistic abilities, and possess the fundamental skills that workers and leaders in an interconnected world need (Ingold & Wang, 2010).

Preparing globally competent students must become a top priority for schools in the United States if they want a future workforce that can compete in an increasingly competitive worldwide environment (Brannon, 2019; National Education Association, 2012). Schools in the United States have historically lagged behind in second language instruction with less than one-quarter of elementary schools in the United States offering world languages in 2010 (Duncan, 2010). According to the National Standards in Foreign Language Education Project (2006), students who are equipped with another language and are culturally aware will be able to communicate effectively in a diverse American society and well beyond its borders.

The first foreign language immersion programs were piloted in the United States in the late 1960s (Boyle, August, Tabaku, Cole, & Baird, 2015). Two-way or dual immersion programs

balance native English-speaking students with students who speak English as a second language and educate the students in both languages (Tedick, Christian & Fortune, 2011). During the same time, one-way language immersion programs were also being developed. The first Spanish immersion program for native English speakers was developed in Culver City, CA in 1971 (Patkowski, 2007). Both types of immersion programs, two-way and one-way immersion, share goals of developing students' bilingualism and biliteracy, encouraging academic achievement, and fostering cross-cultural relations (Patkowski, 2007).

Immersion programs in elementary school are growing in popularity throughout the United States (Sack, 2000). In 2000, there were an estimated 260 dual-language programs in the U.S. In March of that same year, when addressing the state of Hispanic Education, Secretary of Education Richard W. Riley called for an increase to 1,000 such programs by 2005 (Sack, 2000).

In language development, there is a window of opportunity in which the child learns that first language normally (Curtiss, 1996). After this period, the brain becomes slowly less malleable, and by the time the child reaches adolescence, the brain cannot develop richly and normally any real cognitive system, including language (Curtiss, 1996). The four- or five-year-old learning a second language is an ideal model for the idea of the critical period. According to Dr. Curtiss (1996):

...the power to learn a language is so great in the young child that it doesn't seem to matter how many languages you seem to throw their way...They can learn as many spoken languages as you can allow them to hear systematically and regularly at the same time. Children just have this capacity. Their brain is just ripe to do this...there doesn't seem to be any detriment to...develop(ing) several languages at the same time. (p. 17)

When children wait until high school to start studying a foreign language, the process is much more difficult. The job now involves learning the rules of grammar, translating, reading, and trying to develop language learning strategies (Curtiss, 1996). The task is a different one than it was for the young child in the sensitive period for language learning (Curtiss, 1996).

When young children are in a second-language learning environment in which they are surrounded by the language that is made meaningful because of context, they much more quickly absorb the language (Genesee, 2000). Children are given time to process the language that they hear to make connections and meaning until they are ready to use it to express their own thoughts and ideas (Curtain & Dahlberg, 2004). The young child acquires the language through immersion, where an older student or adult would learn vocabulary and grammar out of context (Krashen, 1985).

There is much discrepancy among researchers as to when exactly is the critical time of optimal language learning. Various studies have noted a difference in second language

performance when introduced in the teen years (Johnson & Newport, 1989; Mayberry, 1993; Patowski, 1980). Early research conducted by Lenneberg (1967) proposed the term critical period that refers to the concept that the age limitation is absolute regarding language acquisition, (Lenneberg, 1967). Lenneberg (1967) proposed the age of 14 years to be the critical turning point for language acquisition that leads to pass for native proficiency. A study of nearly 670,000 second language learners conducted by Dr. Joshua Hartshorne of Boston College concluded that second language grammar-learning ability remains strong until age 17 or 18 (Johnson & Newport, 1989). The study also concluded that persons desiring native-like knowledge of the second language should start language instruction before age ten years old (Johnson & Newport, 1989).

Research Questions

This study was guided by the following questions:

1. What differences exist between fourth-grade students educated in a language immersion setting, and students taught in a traditional English setting in standardized test scores for mathematics as measured by the Smarter Balanced Assessment (SBA) for mathematics administered in 2015, 2016, 2017, and 2018?
2. What differences exist between fourth-grade students educated in a language immersion setting, and students taught in a traditional English setting in standardized test scores for English language arts as measured by the Smarter Balanced Assessment (SBA) for mathematics administered in 2015, 2016, 2017, and 2018?
3. What differences exist between fourth-grade students educated in a language immersion setting, and students taught in a traditional English setting in test scores for writing as measured by the district fourth-grade writing assessment administered in 2015, 2016, 2017, and 2018?
4. What differences exist between fourth-grade students educated in a language immersion setting, and students taught in a traditional English setting in standardized test scores for mathematics as measured by the Measure of Academic Progress (MAP) administered in the winter of 2018?
5. What differences exist between fourth-grade students educated in a language immersion setting and students taught in a traditional English setting in standardized test scores for reading as measured by the Measure of Academic Progress (MAP) administered in the winter of 2018?

Purpose of the Study

The purpose of this study was to evaluate the reading, writing, and mathematic proficiency of fourth-grade students enrolled in a one-way Spanish Immersion program in comparison to fourth-grade students enrolled in a traditional program taught only in English. The data analysis was used to determine whether instruction in a one-way Spanish Immersion setting

impacts the standardized test scores of fourth-grade students and if so, to what extent. The school district, as well as the Spanish immersion program, may utilize the data to make decisions on the sustainability of the Spanish immersion program. In this study, the researchers analyzed the standardized assessment data from three different assessments of fourth-grade students from two elementary schools within the same school district and with comparable demographics. Standardized assessment data from fourth-grade students were collected for years 2015, 2016, 2017, 2018 and utilized in this study.

Review of Literature

Foreign language immersion programs also referred to as one-way immersion programs, are designed for English-speaking students. They vary in intensity and structure according to the model implemented. The following are the main types of immersion programs (Center for Applied Linguistics, 2006): Total immersion, partial immersion, and dual or two-way immersion. In all models of immersion instruction, the second language is the medium for content rather than the subject of instruction (Marcos, 2001).

Total Immersion

Programs in which all subjects in the lower grades (K-2) are taught in the target language. Instruction in English usually increases to 20%-50% in the upper elementary grades (3-6), depending on the program. Initial literacy instruction is provided in the target language (Center for Applied Linguistics, 2006). All subject content is taught in the new language starting in kindergarten. Classroom teachers use no English at all in the classroom. English language arts may be introduced in upper elementary grades for one period per day and gradually move towards a more even distribution of English and the second language (Fortune & Tedick, 2003). Full immersion language programs may continue in middle school and high school with classes taught in the target language (Center for Applied Linguistics, 2006).

Teachers use modeling, gestures, manipulatives, and explanations to teach students academic content in the target language (Kareva & Echevarria, 2013). As students learn content, they also receive instruction on how to use the language in each subject. The goal is biliteracy: the idea that students can completely understand, speak, read, and write in both languages (Wiese, 2004). Children in early total immersion programs can achieve a degree of fluency in the target language that would otherwise only be attainable through extended study in the target culture (Curtain & Dahlberg, 2004).

Students from full immersion programs are generally more proficient in reading, writing, listening, and speaking the second language than those from partial immersion programs (Baker, 2011). IQ results of students tested yearly have shown a general trend in which the scores of students educated in a language immersion environment increase more than those of

English-program students. This suggests the possible beneficial effects of second language learning on cognitive development (Downs-Reid, 2000). Total immersion is considered to be the most effective way of developing overall foreign language proficiency (Curtain & Dahlberg, 2004).

Methods

Research Design

The researchers used a non-experimental, causal-comparative, ex post facto research design that the researcher used to determine any significant differences on achievement tests administered in English to fourth-grade students educated in a Spanish immersion program and fourth-grade students educated in a traditional English program. The researchers analyzed annual standardized assessment data of fourth-grade students over the course of four years. One group of students was taught in a traditional English program while the other group of students was taught in a full-immersion Spanish immersion program. This design used ex-post facto data comparing the two groups of fourth-grade students.

Participants

The ABC School District is a pseudonym for the school district that is located in the upper Midwest. It is the largest school district of the state’s 150 school districts. The ABC School District educates 23,700 of the state’s 134,000 k-12 students. The district is comprised of four high schools, five middle schools, and twenty-four elementary schools that vary greatly in size and demographics. There are seventy-six different languages spoken in the District due to the city being a refugee relocation community.

The sample involved in this research project comes from a school district in the Midwest. The district is comprised of students in 36 schools. The sample group is comprised specifically of students who are in fourth-grade at two of the district’s elementary schools that are similar in size, demographics, and socio-economic status. In one school, the native English-speaking students are educated in a 90/10 Spanish immersion program. A 90/10 program delivers 90% of instruction in a student’s second language, and 10% of instruction in the student’s first language (Fortune, 2014). In the second school, the students are taught only in a traditional English setting.

The District demographics are shown below:

Table 1
ABC School District Demographics

Categories	Spanish Immersion School	Traditional School
Overall School Enrollment	609	669

Free/Reduced Rate	12.6%	16.7%
Number of Students	77	112
English Language Learners	1	20
Students in Gr. 4 (2018)	72	116
Gender		
Gr. 4 Boys	34	62
Gr. 4 Girls	38	54
Gr. 4 Students on IEP	11	2
Gr. 4 Students Minority Status	15	18

Note. Information retrieved from the 2017-2018 school year.

Instrumentation

The ex post facto data used in this student was collected from standardized assessments including the Smarter Balanced Assessment (SBA), Measure of Academic Progress (MAP) test, and a fourth-grade writing assessment.

Smarter Balanced Assessment (SBA). Smarter Balanced is an online assessment system that was created by state education agency staff, teachers, higher education faculty and other educators (Smarter Balanced Assessment Consortium, 2017). The goal of the assessment system is to increase the number of students who are well-prepared for college and careers by providing tools for educators to improve teaching and learning. The Smarter Balanced Assessment is the result of the efforts of 30 states that came together in 2010 to submit a grant application to create an assessment system that was aligned to the Common Core State Standards (CCSS), would be conducted online and customizable for students, be composed of test questions that measure essential skills such as critical thinking, writing and problem-solving, provide an vast array of features to ensure testing is fair for all students, and supports teacher in professional development and in-class assessment tools (Smarter Balanced Assessment Consortium, 2017). The consortium of states that developed the Smarter Balanced Assessment was awarded a \$178 million federal grant that was used over the next four years to create the most widely utilized assessment in the United States.

Smarter Balanced created practice tests for each grade that is similar in format and structure to the actual test. These practices tests provide a sample of each kind of question the students might encounter, allowing them to become familiar with the testing format, software, and navigation. Students take a customized test using a computer adaptive format: questions

get harder when students answer correctly and easier when they answer incorrectly, allowing students to better demonstrate what they know (Smarter Balanced Assessment Consortium, 2017).

In 2013, Smarter Balanced conducted a pilot-test in schools across its consortium, which led to the development of additional assessment items, performance tasks, accessibility options, accommodations and the design of the test interface. In 2014, Smarter Balanced conducted a field test and made some additional adjustments before its first operational assessment was deployed in the spring of 2015 (Smarter Balanced Assessment Consortium, 2017).

Smarter Balanced is now a public agency housed at the University of California-Los Angeles Graduate School of Education and Information Studies. It is funded and governed by the states that use its system (Smarter Balanced Assessment Consortium, 2017). The Smarter Balanced Summative Assessment is a state-mandated test that takes place in grades 3-8 and 11 for Mathematics and English Language Arts and is utilized by the ABC School District. Individual student scores, as well as classroom scores, and school scores are furnished to the district and imported into the district's online student assessment program (Smarter Balanced Assessment Consortium, 2017).

Measure of Academic Progress (MAP). In 1973, educators and researchers from Oregon and Washington state school districts formed an association to address what they viewed as a lack of reliable testing systems (Northwest Evaluation Association, 2017). The goal was to create a precise way to measure an individual student's academic level and growth and then use the resulting data as a transformational teaching tool. Four years later the group officially formed as the Northwest Evaluation Association (NWEA) and was incorporated in Oregon (Northwest Evaluation Association, 2017).

The original NWEA assessments gave teachers data they could use to inform classroom instruction. Educators across the country embraced the concept, and NWEA expanded when they introduced the first computer adaptive educational assessment in 1985. NWEA's interim assessment, Measure of Academic Progress (MAP) Growth, followed in 2000 (Northwest Evaluation Association, 2017).

NWEA created a Rasch Unit scale of measurement that is referred to as the RIT. NWEA describes the RIT as stable, equal interval scales that use individual item difficulty values to measure student achievement independent of grade level. Equal interval refers to the difference between scores that is the same regardless of whether a student is at the top, bottom, or middle of the RIT scale. The word stable means that the scores on the same scale from different students, or from the same students at different times, can be directly compared, even though different sets of test items are administered. The RIT score also has the same meaning regardless of the grade or age of the student. The reliability and accuracy of the RIT

scale is the very reason NWEA's MAP has become so popular among school districts. Teachers are supplied with valid, reliable, and predictive data that they can use to differentiate instruction for every student (Northwest Evaluation Association, 2017).

NWEA uses anonymous assessment data from over 10.2 million students to create national norms, placing students and schools within a representative national sample. By drawing from an incredibly wide pool of test records (pulled from more than six million test events, 23,000 schools, and 49 states), NWEA can accurately represent the United States school-aged population (Northwest Evaluation Association, 2017).

NWEA utilizes a team of 40 psychometricians and research scientists to ensure NWEA assessments are innovative, psychometrically-sound, reliable, and useful to teachers, administrators, and parents. They conduct studies that explore the impact of educational policies on students, teachers and school systems. The team also collaborates with school districts and universities to make continual improvements (Northwest Evaluation Association, 2017).

ABC School District administers the MAP with students in grades kindergarten through six each September, January, and May, with September being optional for kindergarten. Following each testing period, individual student scores, as well as classroom scores and school scores, are furnished to the district and imported into the district's online student assessment program. Principals and teachers can analyze their students' performance and adjust classroom instruction to strengthen areas of weaknesses and sustain strengths to better promote student achievement (Northwest Evaluation Association, 2017).

ABC School District fourth-grade writing assessment. The ABC School District's Writing Assessment is administered to students in grade 4 each January. Each student's writing assessment is scored analytically by current and retired teachers from within the school district. The purpose of the annual assessment is to evaluate students' writing in six areas, known as the Six-Trait Analytic Model: Ideas and Content, Organization, Voice, Word Choice, Sentence Fluency, and Writing Conventions.

Each year, approximately 30 current and retired classroom teachers from across the ABC District are trained to score the writing assessments of all students in grade 4. To ensure that scoring is consistent from reader to reader, all scorers receive two hours of initial training followed by periodic review sessions throughout each two-day period. Training is conducted with nationally scored sample papers from Northwest Regional Educational Laboratory and sample student papers utilizing the Six-Trait Analytic Model. All papers are evaluated by two readers. If there is a discrepancy of one point between the two scores, the paper received the average of the two scores. If there was a marked discrepancy greater than one point, the paper is read by a third reader.

Students in grade 4 write from one of two district-selected prompts. Instructional coaches along with the curriculum services department create and select the prompts. After the prompt is introduced, students are given 50 minutes in which to prewrite, write, and edit his/her paper. There are no student names on papers to avoid any bias in scoring.

The papers are scored using the Six-Trait Analytic Rating Guide. In addition to individual scores on the six traits (ideas and content, organization, voice, word choice, sentence fluency and writing conventions), the individual scores are averaged to provide an overall idea of each student's writing. A scale of 1 (Beginning Writer), 2 (Emerging Writer), 3 (Developing Writer), 4 (Expanding Writer), and 5 (Exceeding Writer) is used to rate the traits (see Appendix A). At the time of the study, individual student scores were furnished to the district and imported into the district's online student assessment program.

Data Analysis

The data for the study included the four years of Smarter Balanced Assessments of mathematics and English language arts, four years of the ABC District fourth-grade writing assessment, and one year of the Measure of Academic Progress for mathematics and reading. This quantitative approach used descriptive statistics to answer the research questions by comparing the two groups of students' scores to determine what differences in achievement existed between students taught in a traditional program in English, and those taught in a Spanish immersion program.

All five questions are quantitative in nature. The analysis used percentages, means, and standard deviations, where a $p < .05$ was used as the level of statistical significance. The goal was to determine if a statistically significant difference exists between the results of the assessments given to the fourth-grade students in the Spanish immersion setting and those in the traditional setting. An independent t -test was utilized to determine whether there was statistical evidence that the associated population means were significantly different. For research question one, an independent t -test was used to determine if there was a significant difference in achievement in mathematics between the two populations as measured by the Smarter Balanced Assessment. For research question two, an independent t -test was used to determine if there was a significant difference in achievement in English language arts between the two populations as measured by the Smarter Balanced Assessment. For research question three, an independent t -test was used to determine if there was a significant difference in achievement in writing between the two populations as measured by the fourth-grade ABC District Writing Assessment. For research question four, an independent t -test was used to determine if there was a significant difference in achievement in reading between the two populations as measured by the Measure of Academic Progress. For research question five, an independent t -test was used to determine if there was a significant difference in

achievement in mathematics between the two populations as measured by the Measure of Academic Progress.

Results

The results from the study indicated that students educated in the Spanish Immersion program outperformed students educated in a traditional English setting in the area of mathematics on the Smarter Balanced Assessment in 2018. There was a significant difference between Group 1 ($M = 2495.11$, $SD = 64.106$) and Group 2 ($M = 2510.14$, $SD = 64.38$); $t(-2.95)$, $p = .003$.

Traditional			Spanish Immersion			<i>t</i>	<i>p</i>	Cohen's <i>d</i>
<i>N</i>	Mean	std	<i>N</i>	Mean	std			
43	2495.11	64.106	25	2510.14	64.38	-2.95	.003	.234
4	11	06	2	14	38	2.95	3	5

Note. An independent t -test is associated with this table.

The second research question looked to compare English language arts test results between students educated in the Spanish immersion program to students educated in a traditional English setting in the area of English language arts on the Smarter Balanced Assessment in 2018. There was not a significant difference between Group 1 ($M = 2492.4$, $SD = 72.58$) and Group 2 ($M = 2499.37$, $SD = 75.87$); $t(1.19)$, $p = .233$.

Traditional			Spanish Immersion			<i>t</i>	<i>p</i>	Cohen's <i>d</i>
<i>N</i>	Mean	std	<i>N</i>	Mean	std			
43	2492.4	72.58	25	2499.37	75.87	1.19	.233	.0944
4	11	06	2	14	38	2.95	3	5

Note. An independent t -test is associated with this table.

The results from the study indicated that students educated in the Spanish Immersion program performed as well as students educated in a traditional English setting on the fourth-grade writing assessment in 2018. One student was determined an outlier in SPSS and was removed from this data. There was not a significant difference between Group 1 ($M = 3.21$, $SD = .72$) and Group 2 ($M = 3.31$, $SD = .69$); $t(1.19)$, $p = .076$. The number of participants was slightly different because this was an internal writing assessment as opposed to a standardized test.

Table 4
Fourth-grade Writing Assessment

Discussion and Conclusion

Variable	Traditional			Spanish Immersion		
	N	Mean	std	N	Mean	std
Gr. 4 Writing Assessment	432	3.21	.72	248	3.31	.69

Note. An independent t-test is associated with this table.

The results from the study indicated that students educated in the Spanish Immersion program outperformed students educated in a traditional English setting in the area of mathematics on the Measure of Academic Progress in 2018. As Table 5 indicates, the t-test resulted in a *t*-statistic of -3.41 with 180 degrees of freedom. There was a significant difference between Group 1 (M = 207.09, SD = 11.813) and Group 2 (M = 213.15, SD = 11.52); $t(-3.41), p = .001$.

Table 5
Measure of Academic Progress Mathematics

Variable	Traditional			Spanish Immersion		
	N	Mean	std	N	Mean	std
MAP Mathematics	109	207.09	11.813	72	213.15	11.52

Note. An independent t-test is associated with this table.

The results from the study indicated that students educated in the Spanish Immersion program outperformed students educated in a traditional English setting in the area of reading on the Measure of Academic Progress in 2018. As Table 6 indicates, the t-test resulted in a *t*-statistic of 2.61 with 180 degrees of freedom. There was a significant difference between Group 1 (M = 204.76, SD = 12.63) and Group 2 (M = 209.98, SD = 13.21); $t(2.61), p = .01$.

Table 6
Measure of Academic Progress Reading

Traditional			Spanish Immersion			t	p	Cohen's d
N	Mean	std	N	Mean	std			
109	204.76	12.63	72	209.98	13.21	2.61	.01	-.39

Note. An independent t-test is associated with this table.

This study evaluated the reading, writing, and mathematic proficiency of fourth-grade students enrolled in a one-way Spanish Immersion program in comparison to fourth-grade students enrolled in a traditional program taught only in English. This study suggests that fourth-grade students educated in a Spanish immersion program in ABC School District are performing the same as or above their similarly situated peers who were taught in a traditional program. This difference in academic achievement is potentially due to the way a child's brain works to navigate through two different languages (Fortune, 2014). The literature shows that foreign language study improves cognitive abilities, positively influences achievement in other subjects, and results in higher standardized achievement test scores, particularly when learning the second language begins in elementary school (Cumming-Potvin, Renshaw, & van Kraayenoord, 2003; Hakuta, 1987; Landry, 1974; Marcos, 2001; Lapkin, Hart, & Turnbull, 2001; Weatherford, 1986). Acquiring a second language provides students opportunities to develop new learning strategies. However, it must be noted that in full immersion settings, students' English development may temporarily lag in the areas of reading, word knowledge, and spelling while the primary instruction occurs in the second language (Tedick, Christian, & Fortune, 2011). After a year or two of instruction in English language arts, this discrepancy usually disappears (Serafini, Rozell, & Winsler, 2020). When the alphabet of the second language is similar to that of the native language, many of the cognitive processes that underlie the ability to read transfer from one language to another (Cloud, Genesee, & Hamayan, 2000; Fortune, 2014).

The analysis of data in this study showed that students in immersion education had stronger scores in mathematics than in writing language. Bialystok, Craik, and Luk (2012) conducted a comparison study of monolingual and bilingual children in which they found that the bilingual children were superior on most tests, especially those requiring symbol manipulation and reorganization. Further studies showed a significant advantage for bilingual children in their ability to solve linguistic problems based on understanding such concepts as the difference between form and meaning (Bialystok, Craik, & Luk, 2012).

A 1985 statewide study in Louisiana concluded that third, fourth, and fifth-grade students who received foreign language instruction for 30 minutes a day showed significantly higher scores on the 1985 Basic Skills Language Arts Test than did a similar group that did not study a foreign language (Rafferty, 1986). Similarly, by fifth-grade, the mathematics scores of language students were also higher than those of students not studying a foreign language. Both groups were matched for race, sex, and grade level, and the academic levels of students in both groups were estimated by their previous Basic Skills Test results and statistically equated. The results of the analysis suggest that foreign language study in the lower grades helps

students acquire English language arts skills and mathematics skills (Rafferty, 1986).

The Spanish immersion program in the ABC School District provided all classroom instruction in Spanish in kindergarten through second grade. Rather than teaching language, all content is taught through the second language. Art, music, physical education and library are offered in English. English language arts is first offered in third grade for forty-five minutes per day. The focus is on vocabulary, sentence structure, and conventions that differ between the two languages. In fourth and fifth grade, the English language arts class is offered for fifty-five minutes per day with the same focus on vocabulary, sentence structure, and conventions.

The Spanish immersion program in this study, requires students to begin the program in kindergarten. By second semester of the first grade and throughout the rest of elementary school, students are only allowed to speak Spanish in the classroom. This practice assists students in acquiring the ability to think in Spanish vs. thinking in English and translating to Spanish. Teachers in the program are native or near native speakers. All teachers are required to take the online Oral Proficiency Interview (OPI) and score at least in the Advanced-Mid range to be considered for hire. This practice ensures that students are receiving high quality and appropriate language throughout their day.

The overall research results showed that academic achievement of fourth-grade students educated in this immersion program scored as well as or slightly above their same aged peers in a traditional school on a variety of standardized assessments. This study supports previous research such as studies from Baker (2011) and Curtain and Dahlberg (2004) that students educated in a full second language immersion setting will score at or above their same age peers educated in an English only program, one year or more after English language arts is introduced.

It is the role of the instructional leadership in an immersion program to promote the Spanish immersion program by debunking the often-held misconception of parents that their children will lag behind their peers in English. The goal of this research study was to determine if students educated in a second language would perform at least as well as their same age peers who were taught only in English. Based on the results of this study, school leadership has the data that show the achievement scores from over four years of data that support this claim.

The researcher will share the results of this study with current parents in the program as well as those parents who are considering the program for their preschool child(ren). These results will also be shared with the district's superintendent and curriculum coordinator as they make decisions on whether additional immersion classrooms are needed in the district. These results will be shared with the current teachers in the Spanish immersion program to commend them on their

continued efforts to reach and teach every student. These results will be made public to share with those who are critics of the program's value and purpose.

The researcher believes this study can provide school districts considering starting an immersion program the data they need to convince the stakeholders of the value of such a program. Students in an immersion language program continue to achieve well in their native language, but also have the additional value of a second language. Being bi-lingual and bi-literate provides many more opportunities than being literate in only one language.

Several recommendations for further study emerged from this study. These recommendations include a study with a larger population, including additional grade levels and additional traditional schools of similar size. Further research on dual immersion, two-way programs should be conducted to determine if students in a 50/50 model obtain similar academic skills as those educated in a full immersion one-way program.

Recommendations for the ABC School District

Recommendation one. The researcher recommends that the district use this study when considering the expansion of the Spanish immersion program. There is a high interest by parents to enroll their children in the program which has resulted in significant waiting lists for kindergarten classes over the past six years. Since the Spanish immersion program has moved into a new standalone building and students continue to be performing well on academic measures, there is an increased awareness of the program, generating even more interest. The district should consider providing one or two sections of immersion in some of the other 23 elementary schools located throughout the district. This would not only provide more program opportunities for families but based on the findings of this study, will improve student academic performance across the district.

Recommendation two. The researcher recommends that the district conduct a longitudinal study of these same students as they progress through school. When students in the immersion program attend grades six, seven and eight, their program is a 45/55 model. In this model, students are taught language arts, science and social studies in Spanish while all other academics are taught in English. In high school, students in the immersion program will be taught only one academic class per day, per year in Spanish. A longitudinal study of these students may provide the school district valuable data to support the K-12 Spanish immersion program.

Recommendation for the Spanish Immersion School

The researcher recommends that immersion school leadership use the data generated in this study in marketing of their school and presentations with perspective parents. It is also recommended that the data be shared with current stakeholders including immersion teachers, parents, and students who

should celebrate the successes of their work. Such successes should be built upon to continue to strengthen the program.

Limitations and Delimitations of Study

The results of the research were based on the cumulative scores of all fourth-grade students over four years enrolled in the Spanish Immersion program and those in a traditional school taught in English. The two schools were of similar demographics and from the same school district. The scores of the students taught in English in the traditional school setting were the control group. The researcher used the scores of the control group to measure normal academic achievement on required standardized tests. The control group in the ABC School District had one outlier (#533) that was excluded from the study (see Figure 1). There were no outliers in the Spanish Immersion scores; either high or low. It should be noted that the Spanish Immersion School had one English Language Learner while the Traditional School had 20 English Language Learners, which may have impacted the results of this study. All scores from the students educated in Spanish Immersion were grouped closely together. This would be something that one would want to research further.

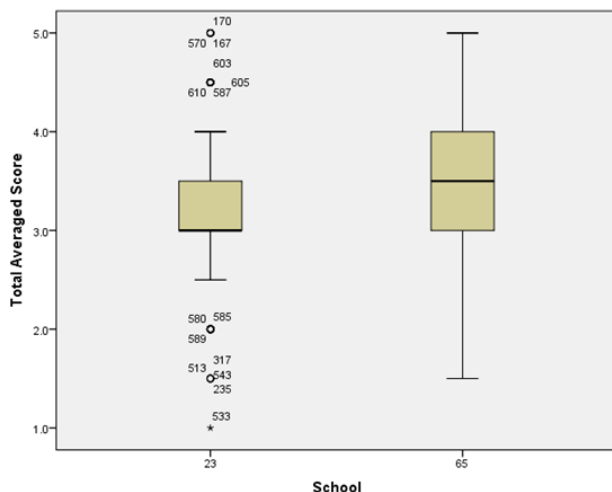


Figure 1. Study Exclusion

Recommendation for Future Research

Recommendations for further research emerged from this study. These recommendations include a study of students in an immersion program in their first year of English and a study with students in the eighth grade after nine years in immersion, both compared to their similarly situated peers who were educated in a traditional English program. Further research should also be completed comparing student achievement from dual two-way immersion programs with traditional programs in English.

References

- Alvear, S. A. (2019). The Additive Advantage and Bilingual Programs in a Large Urban School District. *American Educational Research Journal*, 56(2), 477-513.
- Arce, J. (2000). Developing voices: Transformative education in a first-grade two-way Spanish immersion classroom, a participatory study. *Bilingual Research Journal*, 24(3), 249-260.
- Baker, C. (2011). Foundations of bilingual education and bilingualism (4th ed.). *Multilingual Matters*. doi:10.1177/136700699700100112
- Bialystok, E., Craik, F. I., & Luk, G. (2012). Bilingualism: consequences for mind and brain. *Trends in cognitive sciences*, 16(4), 240-250. doi:10.1016/j.tics.2012.03.001
- Brannon, L. A. (2019). Dual-Language Immersion Programs: Rewriting the Literacy Narrative. *Kappa Delta Pi Record*, 55(3), 118-123.
- Boyle, A., August, D., Tabaku, L., Cole, S., & Simpson-Baird, A. (2015). *Dual language education programs: Current state policies and practices*. Washington, DC: US Department of Education. <https://www.air.org/sites/default/files/downloads/report/Dual-Language-Education-Programs-Current-State-Policies-April-2015.pdf>. doi:10.1037/0022-0663.100.1.162.48
- Center for Applied Linguistics. (2011). *Directory of foreign language immersion programs in U.S. schools*. <http://www.cal.org/resources/immersion/Doc/NumberofSchoolsandDistrictsbyState.pdf>
- Cloud, N., Genesee, F., & Hamayan, E. (2000). *Dual language instruction: A handbook for enriched education*. Boston, MA: Heinle & Heinle.
- Crockett, R. (2015). *The critical 21st-century skills every student need and why*. Global Digital Citizen Foundation. <https://globaldigitalcitizen.org/21st-century-skills-every-student-needs>
- Cumming-Potvin, W., Renshaw, P., & van Kraayenoord, C. E. (2003). Scaffolding and bilingual shared reading experiences: Promoting primary school students' learning and development. *Australian Journal of Language and Literacy*, 26(2), 54-68.
- Curtain, H. A., & Dahlberg, C. A. (2004). *Languages and children, making the match: New languages for young learners*. Allyn & Bacon.
- Curtiss, S. (1996). Language learning and the developing brain. *Learning Languages*, 1(2), 17.
- Downs-Reid, D. (2000). Using English achievement data to promote immersion education. *The ACIE Newsletter*, 3(2), 1-4.

- Duncan, A. (2010). Education and the language gap: Secretary Arne Duncan's remarks at the foreign language summit. Press Office, Department of Education. <http://www.ed.gov/news/speeches/education-and-language-gap-secretary-arne-duncans-remarks-foreign-language-summit>
- Fortune, T., & Tedick, D. J. (2003). What parents want to know about foreign language immersion programs. (ERIC Document Reproduction Service No. ED482493). <https://files.eric.ed.gov/fulltext/ED482493.pdf>
- Genesee, F. (2000). Brain research: Implications for second language learning. ERIC Digests, 2-7. <http://files.eric.ed.gov/fulltext/ED447727.pdf>.
- Hakuta, K. (1987). Degree of bilingualism and cognitive ability in mainland Puerto Rican children. *Child Development*, 58(5), 1372-1388.
- Hayden, M., Levy, J., & Thompson, J. (2015). *The Sage handbook of research in international education*. London, UK: Sage Publications, Ltd.
- Ingold, C. W., & Wang, S. C. (2010). *The teachers we need: Transforming world language education in the United States*. College Park, MD: National Foreign Language Center at the University of Maryland. Retrieved from: http://www.nflc.org/publications/the_teachers_we_need.pdf
- Jackson, E. J. (2016). *Globalization and education*. Oxford Research Encyclopedia of Education. doi:10.1093/acrefore/9780190264093.013.52
- Jacobs, H. H. (Ed.). (2013). *Mastering global literacy*. Solution Tree Press.
- Jacobs, H. H. (2010). A classroom as wide as the world. In *Curriculum*, 21, 97-114. Alexandria, VA: ASCD.
- Johnson, J., & Newport, E. (1989). Critical period effects in second language learning: The influence of maturational state on the acquisition of English as a second language. *Cognitive psychology*, 21, 60-99. doi:10.1016/0010-0285(89)90003-0
- Kareva, V., & Eschevarria, J. (2013). Using the SIOP model for effective content teaching with second and foreign language learners. *Journal of Education and Training Studies*, 1(2), 239-248.
- Krashen, S. (1985). *The input hypothesis: Issues and implications*. Torrance, CA: Laredo.
- Lapkin, S., Hart, D., & Turnbull, M. (2003). Grade 6 French immersion students' performance on large-scale reading, writing, and math tests: Building explanations. *Alberta Journal of Educational Research*, 49(1), 6-23.
- Landry, R. G. (1974). A comparison of second language learners and monolinguals on divergent thinking tasks at the elementary school level. *The Modern Language Journal*, 58(1/2), 10-15. doi:10.2307/323983
- Lenneberg, E. H. (1967). The biological foundations of language. *Hospital Practice*, 2(12), 59-67. doi:10.1080/21548331.1967.11707799
- Mansilla, V. B. & Jackson, A. (2011). *Educating for global competence: Preparing our youth to engage in the world*. Asia Society. New York, NY.
- Marcos, K. M. (2001). Second language learning: Everyone can benefit. *The ERIC review*, 6(1). Retrieved from <http://www.eric.ed.gov/resources/ericreview/vol6nol/langlern.html>.
- Mayberry, R. (1993). First language acquisition after childhood differs from second language acquisition: The case of American sign language. *Journal of Speech and Hearing Research*, 36(6), 1258-1270. doi:10.1044/jshr.3606.1258
- Met, M. (1998). *Critical Issues in Early Second Language Learning: Building for Our Children's Future*. Scott Foresman-Addison-Wesley, 1900 Lake Avenue, Glenview, IL 60025; Retrieved from <http://www.sf.aw.com>
- National Education Association. (2012). *Preparing 21st-century students for a global society: An educator's guide to the "Four Cs"*. Washington, DC: Author.
- Northwest Evaluation Association (2017). Retrieved from <https://www.nwea.org/>
- Patkowski, M. (1980). The sensitive period for the acquisition of syntax in a second language. *Language Learning*, 30, 449-472.
- Petitto, L.-A., & Dunbar, K. N. (2009). Educational Neuroscience: New Discoveries from Bilingual Brains, Scientific Brains, and the Educated Mind. *Mind, Brain, and Education: The Official Journal of the International Mind, Brain, and Education Society*, 3(4), 185-197. doi:10.1111/j.1751-228X.2009.01069.x
- Rafferty, E. A. (1986). Second language study and basic skills in Louisiana. Louisiana State Department of Education. ERIC Document Reproduction Service No. ED 283 360. <https://files.eric.ed.gov/fulltext/ED283360.pdf>
- Sack, J.L. (2000). Riley endorses 'Dual Immersion' programs. Education Week. XIX 28.
- Serafini, E. J., Rozell, N., & Winsler, A. (2020). Academic and English language outcomes for DLLs as a function of school bilingual education model: the role of two-way immersion and home language support. *International Journal of Bilingual Education and Bilingualism*, 1-19.

- Smarter Balanced Assessment Consortium (2017).
<http://www.smarterbalanced.org/>
- Steele, J. L., Slater, R. O., Zamarro, G., Miller, T., Ki, J., Burkhauser, S., & Bacon, M. (2017). Effect of dual-language immersion programs on student achievement: Evidence from lottery data. *American Educational Research Journal*, 54(1), 282-306.
doi:10.3102/000283121664463
- Tedick, D. J., Christian, D., & Fortune, T. W. (Eds.). (2011). Immersion education: Practices, policies, possibilities 83. Multilingual Matters.
doi:10.21832/9781847694041
- Van Roekel, N. P.D. (2010). Global competence is a 21st-century imperative. NEA Policy and Practice Department.
<https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.184.8517&rep=rep1&type=pdf>
- Weatherford, H. J. (1986). Personal benefits of foreign language student (Report No. FL Office of Educational Research and Improvement. Washington DC.
<https://files.eric.ed.gov/fulltext/ED276305.pdf>
- Wiese, A.M. (2004). Bilingualism and biliteracy for all? Unpacking two-way immersion at second grade. *Language and Education*, 18(1), 69-92.
<https://doi.org/10.1080/09500780408666868>

