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THE EFFECTIVENESS OF THE I-READY AND WORD GENERATION INTERVENTIONS ON MIDDLE SCHOOL STUDENTS

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THE EFFECTIVENESS OF THE I-READY AND WORD GENERATION
INTERVENTIONS ON MIDDLE SCHOOL STUDENTS

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Christina Vagenas-Bischoff   Michael Sampson

ABSTRACT

THE EFFECTIVENESS OF THE I-READY AND WORD GENERATION

INTERVENTIONS ON MIDDLE SCHOOL STUDENTS

Christina Vagenas-Bischoff

The increasing number of children who struggle with reading and writing has become a significant challenge for the nation's public schools. The purpose of this quantitative study was to explore the relationship between which intervention a student gets and ELA scores of the online reading program i-Ready compared to the Word Generation program in regards to the reading and writing levels of New York City middle school students. The researcher compared New York City state test scores to determine how student reading levels measured with the i-Ready program vs the Word Generation program. This showed which program had a greater effect on reading and writing levels of middle school students. The researcher also measured the relationship of each intervention individually on general education students, students with disabilities, and English language learners. Participants were based on quota sampling. This was a secondary data analysis of existing publicly available data. The researcher accessed school and grade level data that was listed on a public NYC website. This data was gathered as a part of regular assessment and data collection by the state. The researcher requested the standard deviation of the scale scores from the RPSG research department. Participants were a sample of 1324 students, in a middle school in New York, over 2 school years. Participants also had different tiered levels such as ELL, special education and general

education. The results showed that there is no statistically significant difference between ELA test scores on the NYS Common Core Exam for students who received the i-Ready intervention in 7th Grade and/or Word Generation intervention in 8th Grade. The results also showed that there was a statistically significant difference in measurements across subgroups of student groups (GenEd, SWD, ELL) and interventions received (I-Ready, Word Generation, No Intervention). Future research should explore individual student level data. Recommendations for educators are discussed.

DEDICATION

This dissertation is dedicated to the memory of my grandmother. She inspired me with her strength and instilled in me the love of education. She encouraged me to dream big and pursue any path that leads to my happiness.

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Chapter I: Introduction

The word literacy seems to be ambiguous. The key problem when discussing literacy and its implications is that it does not have a clear-cut definition as to what it means. This problem is characterized by Venezky, Wagner, and Ciliberti (1990) as follows: "Social concepts such as literacy and poverty are integrally tied to their labels. Like jelly and sand, they are without intrinsic shape, defined and redefined by the vessels that hold them. Who is literate depends upon how we define literacy (p. ix)." This is where the bigger problem comes into play. The problem isn't that there is no definition for the word, the problem is that there are too many definitions for the word and they all seem to vary.

Cervero (1985) speaks about how literacy has been the major concern of governments and education for many years, however, Americans cannot come to an agreement as to what it means to be literate in our society. For several decades, literacy has been defined as a specified number of grade levels achieved in formal schooling, varying from fourth to eighth grade (Cook, 1978). In fact, the consensus continues to use grade level achievement to measure the literacy level of the American population. More recently, Purcell-Gates, Dukes, and Stouffer (2016) argues that definitions of reading must go further by attending to the process as it occurs in context of "socioculturally constructed literacy practices" (p.1218), including the values, beliefs, and power relations that characterize those practices, such as those related to language, gender, ethnicity, religion, economics, and geopolitics.

Cervero (1985) questions whether there can even be one clear definition. He suggests that in order to create a common idea that policy makers, program developers, and teachers/ instructors could all use, any definition of literacy must be viewed from a conceptual framework and an operational perspective. By viewing literacy from a conceptual framework there will be a clear guide as to how all the parts of literacy come together. An operational definition would provide direction on how these parts can be brought together and implemented based on specific contexts and demands. This would provide a unitary and conceptual understanding of literacy and can provide a framework for implementation. This conceptual framework would help administrators and teachers make decisions about how literacy integrates into all content areas. This could also help create commonalities and differences in how literacy looks from birth to adulthood and from the classroom to the workplace or in just everyday life. Moreover, this could be the key to creating a clear evaluation criterion by which literacy development could be measured.

Statement of the Problem

The increasing number of children who struggle with reading and writing has become a significant challenge for the nation's public schools. As struggling readers transition through the grade levels, the academic distance between those who read well become more pronounced (Learning First Alliance, 1998; National Reading Panel, 2000; Rashotte, Toregesen, & Wagner, 1997; Torgesen & Burgess, 1998). The U.S. Census Bureau tells us that there were 3.9 million eighth graders in the United States in 2007, based on the National Assessment of Educational Progress (NAEP). Twenty-six percent

of eighth graders who took the 2007 NAEP did not attain basic levels of literacy, and only 31% reached proficiency - meaning that roughly 1 million eighth graders were stalled at basic literacy levels and another 1.7 million were not proficient. Long-observed achievement gaps by race, class, and gender persisted in this NAEP, with youth of color, youth from lower socioeconomic circumstances, and males performing least well (Lee, Grigg, & Donahue, 2007; U.S. Census Bureau, 2007). The Common core standards were put in place in 2010 to increase literacy levels. However, according to the NAEP, thirty-four percent of eighth-grade students performed at or above the NAEP proficient level on the reading level on the reading assessment, which was 3 three percentage points lower compared to 2017, the previous assessment year. Nationwide, student performance on the NAEP rarely changes more than a point or two over the two years between test administrations. The 2019 scores, challenged that trend in 8th-grade reading, where the average score dropped by four points. The reading skills of today's 8th graders are comparable to their counterparts of 10-20 years ago. With all these possible variables affecting reading achievement, how do we really know who is to blame?

The most important criterion for success in the early elementary years is learning to read. Without attaining literacy proficiency, knowledge in other academic fields is hindered and opportunities in society are limited (Kutner et al., 2007; Morrison, Bachman, & Connor 2005; U.S. Department of Education [DOE], 2010). Reading is a remarkably complicated cognitive process. It is common to think of reading as a singular act, something that is done by itself, our brain actually performs a number of tasks at

once each time we open a book. There are five aspects to the process of reading:

phonics, phonemic awareness, vocabulary, reading comprehension and fluency. These

five aspects work together to create the reading experience. As children learn to read,

they must develop skills in all five of these areas in order to become successful readers.

They do not have to happen in any order, or even one at a time. However, they all need

to be developed in order to be able to read successfully.

According to K12 Reader (2008), phonics is the connection between sounds and

letter symbols. It is also the combination of these sound-symbol connections to create

words. Without phonics, words are simply a bunch of squiggles and lines on a page. If

you think about it, letters are arbitrary. There is nothing innately bed-like about the

written word "bed". It is simply the collection of letters and corresponding sounds that

we agree constitute the word "bed". Learning to make that connection between the

individual sounds that each letter represents and then putting those together is

essential to understanding what that funny squiggle means. There are a number of ways

that phonics can be taught because there is a variety of ways to apply this aspect when

reading. Each approach allows the reader to use phonics to read and learn new words in

a different way. Synthetic phonics builds words from the ground up. In this approach

readers are taught to first connect letters to their corresponding phonemes (sound

units) and then to blend those together to create a word. Analytic phonics, on the other

hand, approaches words from the top down. A word is identified as a whole unit and

then its letter-sound connections are parsed out. Analogy phonics uses familiar parts of

words to discover new words. Finally, phonics through spelling focuses on connecting

sounds with letters in writing. All of these approaches can be taught and used independently or in combination to help young readers learn to identify new words.

Phonemic awareness is closely related to phonics because both involve the connection between sounds and words. K12 Reader (2008), also explains that while phonics is the connection between sounds and letters, phonemic awareness is the understanding that words are created from phonemes (small units of sound in language). These may seem like the same thing, but there is a subtle difference in the two. Phonics is used only in written language because it involves letters. Phonemes are sounds only. While they can be represented using letters, they can also be simply the auditory sounds of words. Phonemes are most often learned before a child begins to read because they are centered on the sounds of language rather than written words. Just like phonics, phonemic awareness can be taught and used in a number of ways. Phoneme isolation involves the reader parsing out the individual sounds in a word in order to determine its meaning. Similarly, phoneme segmentation asks the reader to break words into their corresponding phonemes (which may involve one or more individual sounds) to figure out the new word. Both of these approaches are very similar to synthetic phonics. Phoneme identification relies on the reader's general knowledge of phonemes (usually developed through speaking) to identify sound patterns in words. For example, a reader would identify the phoneme /d/ he knows from the words "dog" and "dad" to help him learn how to read a new word "doctor". Finally, phoneme blending requires the reader to connect a series of phonemes together to create a word. This strategy is always used in conjunction with one of the others.

K12 Reader (2008), goes on to explain that as children become stronger, more advanced readers they not only learn to connect their oral vocabularies (the words we know when they are spoken) to their reading vocabularies (the words we know when they are used in print) they also strengthen each of these areas by adding new words to their repertoires. Vocabulary development is an ongoing process that continues throughout one's "reading life." There are two primary ways of teaching and learning new vocabulary words. The first is explicit instruction. This involves someone telling you how a word is pronounced and what its meaning is. That "someone" might be a teacher, a dictionary, a vocabulary guide or any other resource offering definitions and pronunciations. Context clues provide another method for discovering new words. Context clues are the "hints" contained in a text that help a reader figure out the meaning of an unfamiliar word. They include other words in a sentence or paragraph, text features (ie. bold print, italics), illustrations, graphs and charts. Context clues are basically any item in the text that points to the definition of a new word.

Fluency is another key component to reading success. According to K12 Reader (2008), fluency is a reader's ability to read with speed, accuracy and expression. Thus, it requires the reader to combine and use multiple reading skills at the same time. While fluency is most often measured through oral readings, good readers also exhibit this skill when they are reading silently. Fluency is intimately tied to comprehension. A reader must be able to move quickly enough through a text to develop meaning. If he is bogged down reading each individual word, he is not able to create an overall picture in his mind of what the text is saying. Even if the reader is able to move rapidly through a text,

if she cannot master the expression associated with the words, the meaning of it will be lost. Based on the work of Timothy Rasinksi, reading fluency has three important dimensions that build a build a bridge to comprehension. The first dimension is accuracy in word decoding, the ability of a reader to sound out the text with minimal effort. The second dimension is automatic processing, the ability of a reader to make meaning of text with minimal effort. The third dimension is prosodic reading, the ability of a reader to deconstruct a text into syntactically and semantically appropriate units. (Rasiniski, 2004)

When people think about reading, they usually think of reading comprehension. Some think that this is the only important part of reading. However, it cannot act alone. Readers must develop all of the above reading areas. Reading comprehension is understanding what a text is all about. It is more than just understanding words in isolation. It is putting them together and using prior knowledge to develop meaning. Reading comprehension is the most complex aspect of reading. It not only involves all of the other four aspects of reading, it also requires the reader to draw upon general thinking skills. When a reader is actively engaged with a text, she is asking and answering questions about the story and summarizing what she has read. Like vocabulary, reading comprehension skills develop and improve over time through instruction and practice. The ability to read fluently is dependent on the ability of the reader to quickly recognize words that have been learned automatically. The ability to decode words directly impacts reading fluency and comprehension. LaBerge and Samuels (1974) claim that reading fluency problems are the result of poor decoding

skills. Poor readers spend too much time decoding words rather than focusing on the content of the reading. Automaticity of reading words allows the reader to spend less effort decoding and allows for comprehension processes to occur (LaBerge & Samuels, 1974).

In Chall's stages of reading development (1983, 1996), reading is conceptualized not as a process that is the same from beginning stages through mature, skilled reading, but as one that changes as the reader becomes more able and proficient.

First, comes stage 0 which is the pre-reading stage. This stage is from birth to age 6. It covers the greatest period of time and the greatest series of changes than any of the other stages. Chall explains, "From birth until the beginning of formal education, children living in a literate culture with an alphabetic writing system accumulate a fund of knowledge about letters, words, and books. The children grow in their control over various aspects of language—syntax and words. And they gain some insights into the nature of words: that some sound the same at their ends or beginnings (rhyme and alliteration), that they can be broken into parts, and that the parts can be put together (synthesized, blended) to form whole words."

Next, from ages 6-7 comes stage 1. This is the initial reading or decoding stage. This is when children learn their letters and begin to associate them with the corresponding parts of spoken words. In this stage, children and adults interiorize cognitive knowledge about reading, such as what the letters are for, how to know that bun is not bug, and how to know when a mistake is made. In stage 2, ages 7-8, confirmation, fluency and unplugging from print is developed. Stage 2 reading is not for

gaining new information, but for confirming what is already known to the reader. Readers can use the knowledge they have and now pay more attention to the most common printed words. They gain courage and skill in using context and thus gain fluency and speed.

Readers then enter stage 3 and begin to learn new knowledge, information, thoughts and experiences. The focus is on materials and purposes that are clear, within one viewpoint, and limited in technical complexities. This begins to change when they get to stage 4. Stage 4, ages 14-18, explores multiplicity of views and complexity of language and ideas. Without the basic knowledge acquired in Stage 3, reading materials with multiple viewpoints would be difficult.

The final stage, stage 5, occurs at age 18 and above. At stage 5, a reader has learned to read certain books and articles in the degree of detail and completeness that one needs for one's purpose, starting at the end, the middle, or the beginning (Chall,1983, p.10-24).

Background Context

Jorgensen and Hoffman (2003) examine the history of the No Child Left Behind Act and all that led up to it. The movement toward standards-based education and assessment that began with A Nation at Risk "went national" with the passage of the Improving America's Schools Act of 1994 (IASA). IASA reauthorized the Elementary and Secondary Education Act of 1965 (ESEA), first enacted as part of President Lyndon Johnson's War on Poverty, and designed to focus federal funding on poor schools with low achieving students. Title I, aimed at improving education for disadvantaged children

in poor areas, was and remains the cornerstone of ESEA. Title I helped raise the

academic achievement of millions of disadvantaged children, particularly in basic skills.

With the passage of IASA and another important 1994 law, the Goals 2000: Educate

America Act, the ESEA for the first time focused on the needs of all students, not just the

disadvantaged and children at risk of school failure. The results showed that in order for

all children to learn, it was the role of the entire school to be focused on the learning of

every child. The redesigned ESEA encourages States and school districts to connect

federal programs with State and local reforms affecting all children, while retaining the

focus on educational equity for children with special needs. The de facto segregation of

students into "regular" classrooms and "special services" classrooms had to end. This

led the IASA to amended to require all states to have content and performance

standards, assessments aligned to those standards and the accountability system to

identify schools that were not helping all students perform as expected on the

assessments given. On January 8, 2002, President George W. Bush signed into law the

No Child Left Behind Act of 2001 (NCLB). The NCLB act "punctuated the power of

assessment in the lives of students, teachers, parents, and others with deep

investments in the American educational system. NCLB brought considerable clarity to

the value, use, and importance of achievement testing of students in kindergarten

through high school" (Jorgensen & Hoffman,2003). In order to create this shift, the

Common Core standards were released in 2010. They represent an alignment of content

guidelines across individual states in the areas of English language arts and

mathematics. Led jointly by the National Governors Association Center for Best

Practices and the Council of Chief State School Officers (CCSSO), the Common Core State Standards Initiative developed these standards as a state-led effort to establish consensus on expectations for student knowledge and skills that should be developed in Grades K–12. Most recently, the Every Student Succeeds Act (ESSA) provides New York State with an opportunity to leverage significant federal resources in support of New York State's commitment to providing equity, access, and opportunity for all students.

Fluency Development Program

The Fluency development program (FDL) (Rasinski, Padak, Linek, & Sturtevant, 1994) was developed as a fluency intervention that can be applied to large groups of normally developing elementary-grade students or more intensively to smaller groups of students who have yet to achieve proficiency in fluency and who also struggle in overall reading achievement. The Kent State University reading clinic works exclusively with children experiencing difficulty in reading. Regular use of the FDL (four days per week for four weeks) resulted in substantial gains in word recognition accuracy, automaticity, and comprehension (Zimmerman, Rasinski, & Melewski, 2013). Implementation of a home version of the FDL called Fast Start Reading (Rasinski & Stevenson, 2005) found that at-risk first-grade students nearly doubled the progress over a similar group of students, who received similar instruction in school but no home intervention, in letter and word recognition accuracy and in word recognition automaticity over less than three months.

Reading Recovery

Reading Recovery (Shanahan & Barr, 1995), one of the few proven instructional interventions for struggling first-grade readers, is a good example of intentional, intensive, consistent, synergistic instruction. Each day, students are taken through a consistent, multifaceted protocol aimed at improving both reading and writing. Though proven effective, Reading Recovery is limited to first grade, provides instruction to only one student at a time, and requires considerable time per lesson (30 minutes). The program was designed by Marie Clay for the purpose of intervening with young children in New Zealand identified as having reading problems. According to Holdaway (1979), Clay's own research regarding Reading Recovery in New Zealand (Clay, 1985) has been criticized, in particular by Nicholson (1989) and Robinson (1989). These authors point out that, although Clay provides clear evidence that children improve on measures that she has designed, there is no evaluation for transfer to other reading measures.

Predictive Language

Research has shown that stories featuring patterned literary structures are easy for students to read (Bridge, 1979, 1986; Rhodes, 1981; Yellin & Blake, 1994). Such structures are sometimes called predictable books or structured language books. This term is used to highlight patterns or genres found in these books. These patterns are a great way for students to learn the structure of writing that they can use in their own work. Sampson, Sampson and Rasinksi discuss the use of predictable books to develop oral language abilities that are not natural in home-rooted language. These literary-level language abilities gained from reading predictable materials permit students to

move into the reading and writing of sophisticated literature at a much faster rate.

When stories with predictable language patterns are read with students, the patterns

become a part of the students' language repertoire. What students hear and say can be

used as a basis for writing, and patterns provide a framework for putting ideas into

print. In order for children to successfully move toward self-selection of reading, it is

important that they have some prior experience in dealing with language that has

characteristics of a predictive sequence.

Fluency-Oriented Reading Instruction

The Fluency-Oriented Reading Instruction (Stahl & Heubach, 2005) uses the

stage model of reading. The purpose of the fluency-oriented reading instruction was to

help children move from the accuracy-driven decoding, typical of the Decoding stage, to

the fluency and automaticity needed to take advantage of reading to learn.

Wide Fluency Oriented Reading Instruction

Wide Fluency Oriented Reading Instruction (Wide FORI; Kuhn et al., 2006),

makes use of multiple texts coupled with scaffolded reading strategies. These two

approaches are designed for whole-class instruction and are meant for second and third

graders—students who are making the transition to fluent reading at what we consider

to be a developmentally appropriate point. These approaches have helped promote the

fluency development of second graders across several studies (Kuhn et al., 2006; Stahl &

Heubach, 2005; Schwanenflugel et al., under review) and have set the stage for fluency

development in several ways. Both make use of challenging material that exposes

children to a variety of concepts, vocabulary, and ideas that might not be accessible through instructional-level texts.

Just Words/Wilson

Just Words is a highly explicit, multisensory decoding and spelling program for student in grade 4-12 and adults who have mild to moderate gaps in their decoding and spelling proficiency but do not require intensive intervention. It is designed for students who can benefit from the targeted word study focus without requiring the more comprehensive intervention of the Wilson Reading System. In a controlled study by Wilson Language Training, students who received Just Words made greater gains than students receiving instruction as usual. In addition, English language learners who received Just Words made greater gains in reading levels than those who just received instruction as usual. There was also an increase in the number words read correctly and reading accuracy.

According to Tammy Johnson, M.S. from the Florida Center for Reading 3 Research (2004), Wilson Reading System utilizes a plan in which students receive instruction in learning to hear sounds by manipulating color coded sound, syllable, and word cards; performing finger-tapping exercises to assist in phonemic awareness; and through a read aloud. Based on the work of Ricci (2011), students in Wilson reading made an average increase of 4 points from pre to post test results. Students in the Wilson reading program, therefore, had an average increase of 2.5 points over guided reading when compared to all assessed skill areas.

Digital Literacy

Just like the concept of literacy, the term "digital literacy" is so wide-ranging, it can cause confusion. While the word "literacy" alone generally refers to reading and writing skills, when you tack on the word "digital" before it, the term embodies much, much more. The American Library Association's digital-literacy task force offers this definition: "Digital literacy is the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills." More simply, Hiller Spires, a professor of literacy and technology at North Carolina State University, views digital literacy as having three buckets: 1) finding and consuming digital content; 2) creating digital content; and 3) communicating or sharing it. As technology becomes a part of daily life, it's more important than ever for children to learn digital literacy. However, the big question lies in which is more important. If students are illiterate and are below the proficiency level, what should be the focus, literacy or digital literacy? Will students be able to master digital literacy if they are not proficient? Educators are constantly faced with this problem. The new push for digital literacy is changing the focus in classrooms.

Has this led to change?

Despite our country's best efforts over the past several years, despite various policy initiatives at the national and state levels in the United States, despite the work of well-trained and highly motivated teachers and school leaders, despite the ever-growing body of quality literature available for children, we still have many children who struggle in becoming proficient readers (Rasinski, 2012). According to the U.S. National

Assessment of Educational Progress (National Center for Education Statistics, 2015),

24% of eighth-grade students and 27% of 12th-grade students achieve below the "basic"

level. Students who score below "basic" manifest difficulties in locating relevant

information, making simple inferences, and using their understanding of the text to

identify details that support a given interpretation or conclusion. They also experience

difficulty in interpreting the meaning of words as they are used in the text.

The National Assessment of Educational Progress (NAEP) is the only assessment

that measures what U.S. students know and can do in various subjects across the

nation, states, and in some urban districts. Also known as The Nation's Report Card,

NAEP has provided important information about how students are performing

academically since 1969. NAEP is a congressionally mandated project administered by

the National Center for Education Statistics (NCES) within the U.S. Department of

Education and the Institute of Education Sciences (IES). NAEP is given to a

representative sample of students across the country. Results are reported for groups of

students with similar characteristics (e.g., gender, race and ethnicity, school location),

not individual students. National results are available for all subjects assessed by NAEP.

State and selected urban district results are available for mathematics, reading, and (in

some assessment years) science and writing. According to the results in 2017, the

average score of fourth-grade students in New York was 222. As seen in Table 1, this

was not significantly different from the average score of 221 for public school students

in the nation. The average score for students in New York in 2017 (222) was not

significantly different from their average score in 2015 (223) and was higher than their

average score in 1998 (215). The percentage of students in New York who performed at

or above the NAEP Proficient level was 36 percent in 2017. This percentage was not

significantly different from that in 2015 (36 percent) and was greater than that in 1998

(29 percent). The percentage of students in New York who performed at or above the

NAEP Basic level was 68 percent in 2017. This percentage was not significantly different

from that in 201. Showing similar results, the average score of eighth-grade students in

New York was 264. As seen in table 2, this was not significantly different from the

average score of 265 for public school students in the nation. The average score for

students in New York in 2017 (264) was not significantly different from their average

score in 2015 (263) and in 1998 (265). The percentage of students in New York who

performed at or above the NAEP Proficient level was 34 percent in 2017. This

percentage was not significantly different from that in 2015 (33 percent) and in 1998 (32

percent). The percentage of students in New York who performed at or above the NAEP

Basic level was 73 percent in 2017. This percentage was not significantly different from

that in 2015 (73 percent) and in 1998 (76 percent). As seen in table 3, in 2019 the

average score of fourth-grade students in New York was 220. This was not significantly

different from the average score of 219 for students in the nation. The average score for

students in New York in 2019 (220) was not significantly different from their average

score in 2017 (222) and was higher than their average score in 1998 (215). The

percentage of students in New York who performed at or above the *NAEP Proficient*

level was 34 percent in 2019. This percentage was not significantly different from that in

2017 (36 percent) and was higher than that in 1998 (29 percent). The percentage of

students in New York who performed at or above the *NAEP Basic* level was 66 percent in 2019. This percentage was not significantly different from that in 2017 (68 percent) and in 1998 (62 percent). As seen in table 4, in 2019 the average score of eighth-grade students in New York was 262. This was not significantly different from the average score of 262 for students in the nation. The average score for students in New York in 2019 (262) was not significantly different from their average score in 2017 (264) and in 1998 (265). The percentage of students in New York who performed at or above the *NAEP Proficient* level was 32 percent in 2019. This percentage was not significantly different from that in 2017 (34 percent) and in 1998 (32 percent). The percentage of students in New York who performed at or above the *NAEP Basic* level was 70 percent in 2019. This percentage was not significantly different from that in 2017 (73 percent) and was lower than that in 1998 (76 percent).

Table 1

The National Assessment of Educational Progress Achievement- 2017 Level Percentages and Average Reading Score Results in 4th grade student in New York State
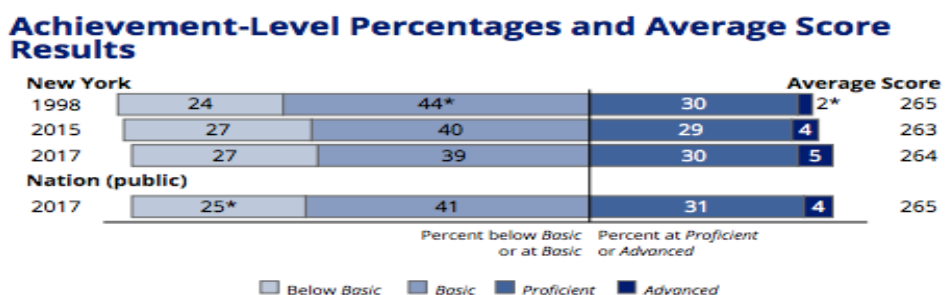
Achievement-Level Percentages and Average Score Results

New York				Average Score
1998	24	44*	30	2*	265
2015	27	40	29	4	263
2017	27	39	30	5	264
Nation (public)				
2017	25*	41	31	4	265

Percent below *Basic* or at *Basic*   Percent at *Proficient* or *Advanced*

☐ Below *Basic*   ☐ *Basic*   ■ *Proficient*   ■ *Advanced*

* Significantly different (*p* < .05) from state's results in 2017. Significance tests were performed using unrounded numbers.
NOTE: Detail may not sum to totals because of rounding.

Table 2

The National Assessment of Educational Progress Achievement- 2017 Level Percentages

and Average Reading Score Results in 8[h] grade student in New York State

Achievement-Level Percentages and Average Score Results

New York	Below Basic	Basic	Proficient	Advanced	Average Score
1998	38*	33	23	6*	215*
2015	32	33	27	9	223
2017	32	32	27	9	222
Nation (public)					
2017	33	31	27	9	221

Percent below *Basic* / or at *Basic*   Percent at *Proficient* / or *Advanced*

☐ Below *Basic*   ■ *Basic*   ■ *Proficient*   ■ *Advanced*
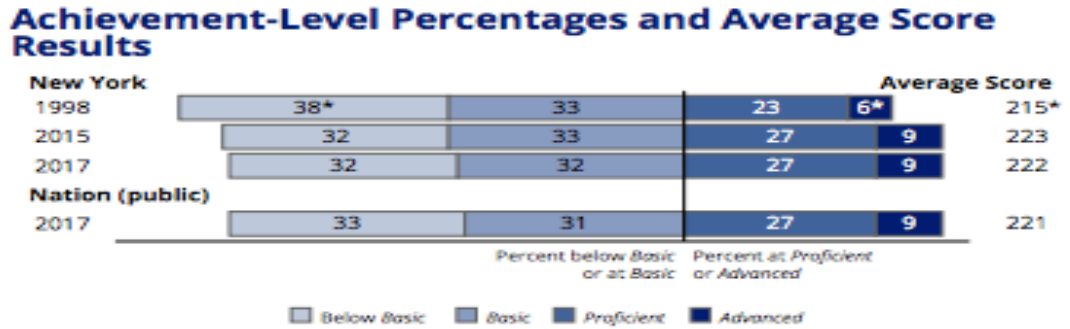
* Significantly different (*p* < .05) from state's results in 2017. Significance tests were performed using unrounded numbers.
NOTE: Detail may not sum to totals because of rounding.

Table 3

The National Assessment of Educational Progress Achievement- 2019 Level Percentages

and Average Reading Score Results in 4[h] grade student in New York State

NAEP Achievement-Level Percentages and Average Score Results

New York	Below NAEP Basic	NAEP Basic	NAEP Proficient	NAEP Advanced	Average Score
1998	38	33	23	6	215*
2017	32	32	27	9	222
2019	34	31	26	8	220
Nation					
2019	35	31	26	9	219

Percent below *NAEP Basic* / or at *NAEP Basic* level   Percent at *NAEP Proficient* / or *NAEP Advanced* level

☐ Below *NAEP Basic*   ■ *NAEP Basic*   ■ *NAEP Proficient*   ■ *NAEP Advanced*
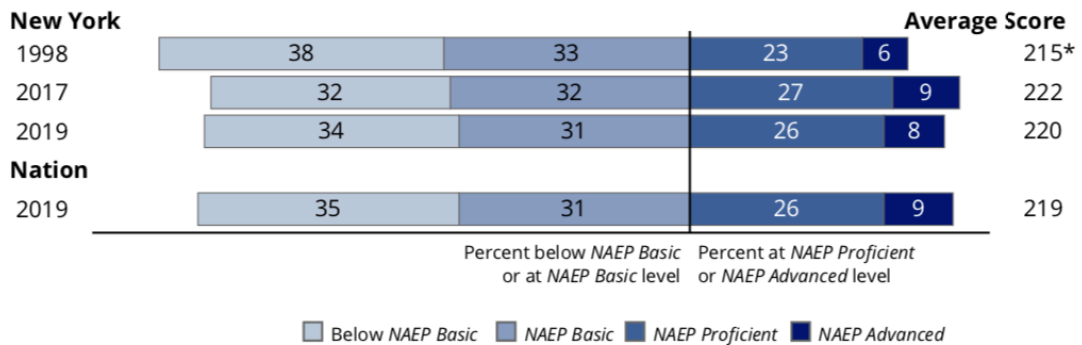
Table 4

The National Assessment of Educational Progress Achievement- 2019 Level Percentages

and Average Reading Score Results in 8[h] grade student in New York State

NAEP Achievement-Level Percentages and Average Score Results

New York					Average Score
1998	24*	44*	30	2*	265
2017	27	39	30	5	264
2019	30	38	28	4	262
Nation					
2019	28	39	29	4	262

Percent below *NAEP Basic*   Percent at *NAEP Proficient*
or at *NAEP Basic* level   or *NAEP Advanced* level

☐ Below *NAEP Basic*   ☐ *NAEP Basic*   ■ *NAEP Proficient*   ■ *NAEP Advanced*
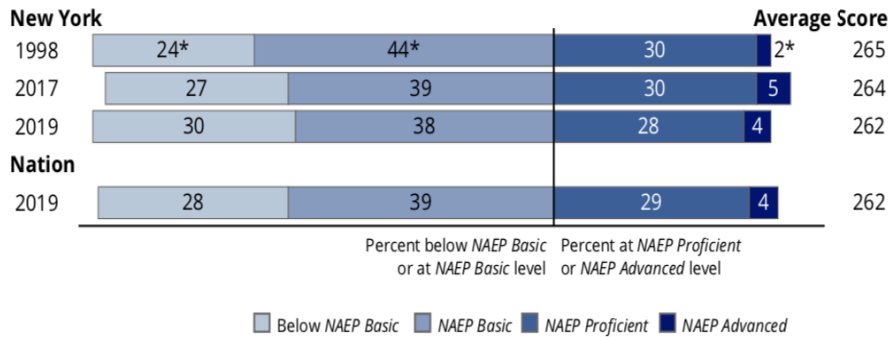
These results show there has not been a significant difference in 4th and 8th

grade student's reading levels from 1998 to 2019. The results also show the overall

levels, below basic, basic, proficient and advanced have not shifted over the years. This

shows there has been almost the same number of students for each level from 1998 to

2017. However, the major concern is the number of students NAEP proficient or higher

has decreased from 2017-2019. This proves the point that despite all the steps taken we

still have many children who struggle in becoming proficient readers.

Sociocultural Perspective

From its beginnings, our nation's school system has treated students differently,

depending on their race, social class, and gender. Today, despite gains in educational

opportunities, significant gaps in academic achievement persist among groups. As a

nation, we have struggled to correct the flawed doctrine of "separate but equal" and

the inequitable policies and practices that persisted for decades. As educators, we must now understand and interrupt the systematic ways that groups of students are still being treated inequitably today. We must explore new ways of thinking about what and how to teach.

According to the National Education Association over the last several years, student achievement has increased for all groups in all subjects, yet the gaps between rich and poor, White and minority remain a persistent problem. A number of events have occurred on the national, state, and local levels that have made an impact on how schools and teachers approach the issue of closing the achievement gaps. The growing ethnic, racial, and economic diversity of our classrooms is demanding new strategies and skills in communication, instruction, and curriculum development. At the same time, standards-based reform, budget and program cuts, federal and state accountability laws, the "adoration" of test scores as the sole measure of school success, and overwhelmed parents and educators have placed a heavy demand on public education's and educators' resources.

Socioeconomic status (SES), a measure of one's overall status and position in society, strongly influences an individual's experiences from childhood and through adult life. Research is beginning to shed light on the mechanisms through which experiences in the social world during early childhood affect the structure and function of the brain. Human brain development occurs within a socioeconomic context and childhood socioeconomic status (SES) influences neural development — particularly of the systems that subserve language and executive function. Research in humans and in

animal models has implicated prenatal factors, parent–child interactions and cognitive

stimulation in the home environment in the effects of SES on neural development.

These findings provide a unique opportunity for understanding how environmental

factors can lead to individual differences in brain development, and for improving the

programs and policies that are designed to alleviate SES-related disparities in mental

health and academic achievement (Hackman, Farah & Meaney, 2010). By the time of

school entry, children from lower SES backgrounds typically score between one-half and

one full standard deviation lower than other children on most academic achievement

tests (Rouse, Brooks-Gunn & McLanahan, 2005). The most alarming findings indicate

that a substantial proportion of students who succeed in learning to read in the primary

grades go on to encounter difficulties after third grade, confirming findings from prior

research conducted with smaller samples (e.g., Catts et al., 2005; Leach et al., 2003;

Lipka et al., 2006). Moreover, students who are English Language Learners (ELLs) and

those from low-SES backgrounds disproportionately demonstrate such difficulties,

although SES may explain why English Language Learners (ELL) have an elevated risk of

late-emerging difficulties. In addition, among students from high-SES backgrounds, the

risk for difficulties emerging in middle school was slightly higher than the risk for early-

emerging difficulties, suggesting that the particular challenges of adolescent literacy are

not limited to students from low-SES backgrounds (Carnegie Council on Adolescent

Literacy, 2010).

What is the i-Ready program?

The I–ready program was created in 2012 and was built for the Common Core, and combines a valid and reliable growth measure and individualized instruction in a single online product. The program promises to save teachers time at a fraction of the cost of similar products. The program provides rigorous, on-grade level instruction and practice with additional downloadable lessons to help meet individual student or small group needs. i-Ready provides personalized student instruction targeted to students' unique areas of need and mobile apps to boost achievement. It includes easy-to-use reporting and ongoing progress monitoring provides educators with real-time insights for each student at the class, school, and district level.

What is the Word Generation program?

In response to administrators' and teachers' worries about the vocabulary skills of Boston Public School students, Strategic Education Research Partnership (SERP), collaborated with Harvard Graduate School of Education Professor Catherine Snow to design a curriculum supplement called *Word Generation*, for sixth- to eighth-grade classrooms. According to SERP, this research-based intervention focuses on "all-purpose" academic vocabulary words — words that are relevant across disciplines, but that are infrequently used in casual conversation. Word Generation is a 24-week sequence that introduces five new words a week by embedding them in brief texts about controversial issues of interest to many adolescents.

Beyond teaching vocabulary, the program is designed to support students' oral language skills, argumentation strategies, and writing skills, while also educating students about issues of current public interest. The program provides encounters with a target

word in semantically rich contexts within motivating texts, rather than in a list of words, repeated exposure to the word, in varied contexts, opportunities to use the word orally and in writing, explicit instruction in the word's meaning, and explicit instruction in word learning strategies, including analysis of the word's parts (morphemes), and its multiple subject-specific meanings (polysemy). Word Generation zeros in on these research-based practices to promote students' learning of the target vocabulary words.

Purpose of the Researcher

The researcher explored the relationship of the online reading program i-Ready compared to the Word Generation program in regards to the reading and writing levels of New York City middle school students. The researcher compared New York City state test scores to determine how student reading levels measured with the i-Ready program vs the Word Generation program. This will show which program has a greater effect on reading and writing levels of middle school students. The researcher will also measure the relationship of each intervention individually on general education students, students with disabilities, and English language learners.

The study's results would provide districts, principals, teachers, and parents, in NYC schools, with a better understanding of the relationship between i-Ready and Word Generation and student reading achievement in middle school classrooms. It can also help them understand which intervention has a greater effect depending on the type of student they are trying to aid. The results could either encourage or discourage them into using i-Ready vs Word Generation.

Definition of Terms

The *U.S. Census Bureau* is the federal's government's largest statistical agency. It is dedicated to providing current facts and figures about American's people, places, and economy. The Census Bureau's primary mission is conducting the U.S. Census every ten years, which allocates the seats of the U.S. House of Representatives to the states based on their population. The information also informs decisions on where to build and maintain schools, hospitals, transportation infrastructures, and police and fire departments.

The *National Assessment of Educational Progress (NAEP)* is an assessment given to a representative sample of students across the country. Results are reported for groups of students with similar characteristics (e.g, gender, race and ethnicity, school location), not individual students. It is the only assessment that measures what U.S. students know and can do in various subjects across the nation, states, and in some urban districts. The NAEP, also known as The Nation's Report Card, has been providing information about student academic performance since 1969.

The *Elementary and Secondary Education Act of 1965 (ESEA)* was created by President Lyndon B. Johnson to support his fight against poverty. This law shed light on the impact of poverty on education and represented a landmark commitment to equal access to quality education. The ESEA funded primary and secondary education, emphasizing high standards and accountability. Funds were allocated for professional development, instructional materials, resources to support educational programs, and the promotion of parental involvement. This act was to be carried out for five years. The

government has reauthorized the act every five years since its introduction with a variety of revisions and amendments.

The *Improving America's Schools Act of 1994 (IASA)* was signed by President Clinton in 1994 to reauthorize the Elementary and Secondary Act. This act created program changes and allocated funds for specific areas such as: helping disadvantage children meet high standards, technology for education for all students, promoting equity for all, supporting bilingual education, supporting Indian, Native Hawaiian, and Alaska Native Education, supporting programs of national significance, and improving school facilities.

The *No Child Left Behind Act (NCLB)* was signed into law by President George W. Bush in 2002. This Act is the most recent update to the Elementary and Secondary Education Act of 1965. The NCLB was created when concern began that the American education system was no longer internationally competitive. This act increased the responsibility on schools for the academic progress of all students but focused especially on the increase of performance of certain groups of students, such as English-language learners, students in special education, and poor and minority children, whose achievement, on average, trails their peers. Under the NCLB law, states must test students in reading and math in grades 3 through 8 and once in high school. And they must report the results, for both the student population as a whole and for particular "subgroups" of students, including English-learners and students in special education, racial minorities, and children from low-income families. The law also requires states to

ensure their teachers are "highly qualified," which generally means that they have a bachelor's degree in the subject they are teaching and state certification.

The *National Governors Association Center for Best Practices* was founded in 1908 and is the voice of the nation's governors. It is one of the most respected public policy organizations in the country. The association is comprised of the governors of the 55 states, territories and commonwealths. Through NGA, governors identify priority issues and deal with matters of public policy and governance at the state, national and global levels.

The *Council of Chief State School Officers (CCSSO)* is a nationwide, nonprofit organization composed of the public officials who head the departments of elementary and secondary education in the states, five U.S. extra-state jurisdictions, the District of Columbia, and the Department of Defense Education Activity. The council advocated federal education policy that will be the most effective in increasing student achievement.

The *Common Core State Standards* is a set of high-quality academic standards in mathematics and English language arts/literacy (ELA). These learning goals outline what a student should know and be able to do at the end of each grade. The standards were created to ensure that all students graduate from high school with the skills and knowledge necessary to succeed in college, career, and life, regardless of where they live. Forty-one states, the District of Columbia, four territories, and the Department of Defense Education Activity (DoDEA) have voluntarily adopted and are moving forward with the Common Core.

Research Questions

R1. Is there a statistically significant difference between ELA test scores on the NYS Common Core Exam for students who received the i-Ready intervention and/or Word Generation intervention?

R2. Is there be a statistically significant difference between ELA test scores on the NYS Common Core Exam for certain subgroups (i.e., general education, special education, English language learners) of students who received the i-Ready intervention and/or the Word Generation intervention?

H1. Students who received only the intervention i-Ready will show more growth on the New York ELA state test that students who received the Word Generation intervention.

H2. Special Education students who received only the i-Ready intervention will show the most growth on the New York ELA state test.

Chapter II: Review of the Related Literature

The literature on multitiered, research-based reading interventions provides strong evidence for the critical role of early reading instruction and the benefits of early intervention for children who are struggling to learn to read (Denton, Fletcher, Anthony, & Francis, 2006). A significant number of students demonstrate reading difficulties that persist into their middle and high school years. In 2007, the National Assessment of Educational Progress reported that 69% of eighth-grade students were unable to successfully derive meaning from grade-level text. With such a high prevalence of reading problems in the middle grades and an increasing focus on improving high school retention and preparing students for postsecondary learning, adolescent reading instruction has become increasingly important (Kamil et al., 2008).

Ivy and Fisher (2006) explain, without these two nonnegotiable features of the learning environment—access to high-quality, readable texts and instruction in strategies to read and write across the school day—it is doubtful that a specific, limited intervention will make much of a difference. If a school has already made these fundamental changes and there are still students who struggle to read, it is likely that an intervention program or initiative is necessary.

Neal and Kelly (2002) draw an important distinction between intervention and remediation, by identifying six characteristics of successful intervention programs that accelerate reading skills in older students: 1) Consider individual student needs; 2) implement an apprenticeship model of teaching and learning; 3) Select appropriate materials; 4) establish a focus on accelerative instruction; 5) consider the role of fluent

responding; and, 6) provide for affirmation of success. Current researchers (Lovett, Lacerensa, Borden, Fritjers, Seteinbach, & DePalma,2000; Torgesen, Alexander, Wagner, Rashotte, Voeller, Conway, & Rose, 2001) indicate that to increase reading skills in older children with serious reading problems requires intensive paced reading with explicit decoding emphasis than are typically observed in public school intervention programs. Reading difficulty stem from many avenues among older readers, such as: 1) poor word identification; 2) guessing on words based on the context; 3) decoding unfamiliar words; and 4) lack of fluent word recognition. Also, reading comprehension tends to move up to a level that is consistent with their general verbal skills.

Ivy & Fisher (2006) suggest that the people who have the power to purchase, implement, or develop a program consider these five guidelines: (see Table 5)

Table 5 *Intervention and Support for Struggling Readers- Do the intervention initiatives cause students to read more and better?*

Figure 1
Intervention and support for struggling readers

Do the intervention initiatives cause students to read more and better?

	5	4	3	2	1
4.1 Level of teacher involvement	Significant teacher involvement in the design and delivery of the intervention		Some teacher oversight but the majority of the program is delivered by volunteers or paraprofessionals		Limited or no teacher involvement; intervention is delivered in the absence of a teacher (e.g., computer-only programs or take-home workbooks)
4.2 Intervention reflects a comprehensive approach to reading and writing	Intervention is comprehensive and integrated such that students experience reading and writing as a cohesive whole		Intervention includes important components of the reading processes but addresses them separately (e.g., 15 minutes of word study followed by an unrelated comprehension activity); either reading or writing are addressed, but not both		Intervention focuses on an isolated skill (e.g., topic sentence) or singular aspect of literacy development (e.g., phonics, phonemic awareness, fluency, vocabulary, comprehension)
4.3 Intervention reading and writing is engaging	Authentic children's and adolescent literature (fiction and nonfiction) are at the core of the intervention		Isolated paragraphs on topics selected by intervention program		Artificial text; no connected text; skills work
4.4 Intervention instruction is driven by useful and relevant assessments	Teacher-administered assessments are ongoing and are used to tailor individual instruction; writing samples and text-based discussions are one type of assessment used		Uniform assessments are used for placement, program entry, and program exit		All students start at the same point and move through the intervention components regardless of their individual performance
4.5 Intervention includes significant opportunities for authentic reading and writing	The majority of intervention time is devoted to authentic reading and writing		Periodic opportunities are provided for students to read or write		No connected reading and writing is provided or required (e.g., sole focus on word-level activities or skills worksheets)

Source: Ivey, G., & Fish, D. (2006). *Creating literacy-rich schools for adolescents*.

Alexandria, VA: Association for Supervision and Curriculum Development.

In middle and high schools, we have somewhat of a "Catch-22." We know that when it

comes to improving literacy, teachers—not methods or materials—make the most

difference (Duffy & Hoffman, 1999). But how often do secondary teachers really get an

opportunity to create individualized interventions for their struggling readers? When do

secondary teachers have the time to work one-on-one everyday with every struggling

reader, while teaching the curriculum given to them? In the following sections, I will

discuss various interventions and the research behind them, as it relates back to these

questions.

CAI (Computer Assisted Instruction)

The accessibility of computers and the invention of the internet have

transformed the way we see classrooms today. The American educational system

progressed from one-room schoolhouses to virtual online schools. Due to the

possibilities of the Internet, instructional practices and the access to new knowledge has

become limitless.

A more comprehensive review of the effects of CAI's as a tool to deliver reading

instruction has been published by Blok et al. (2002) and Higgins et al. (2012). Although

the evidence on the positive impact of using technological approaches to learning is

equivocal, there is general agreement that CAI's can be beneficial when used to deliver

short, focused interventions for lower attaining and/or 'at risk' pupils as a

supplementary provision alongside normal classroom teaching (Hall, Hughes and Filbert, 2000; Higgins et al., 2012a).

Zouaghi (2016) concluded that many studies proved the benefits of Computer Assisted Instruction (CAI) in improving reading comprehension. Some researchers claimed that CAI improves the phonological sensitivity skills of children who are at risk as main reason to use such a tool in reading instruction. Others indicated that, there is a need for a follow-up assessment, in order to explore the effectiveness of the use of the computer as an instructional tool in reading comprehension. Moreover, another research study indicates that CAI can offer an effective educational tool to help poor readers more than print especially when CAI is applied in an interactive instructional environment. In addition, many researchers called for the use of CAI in instruction since it provides a positive motivation toward learning. Tillman (2004) points out to the existence of an enormous body of work linked to CAI, yet he argued that there is a much smaller amount of research has been devoted to the impact of CAI on reading instruction (Tillman, 2004).

Jostens

The system is designed to provide an extensive set of assessments, which place students in an individualized instructional sequence. Students work individually on exercises designed to fill in gaps in their skills. Jostens/Compass Learning ILS programs are typically used 15-30 minutes per day, 2-5 days per week. Three qualifying studies examined the effectiveness of Jostens in the 1990s. Across the three studies of Jostens, the weighted mean effect size was +0.19.

Lexia

Lexia Learning Systems has two supplemental computer-assisted instruction programs: Phonics Based Reading (PBR) and Strategies for Older Students (SOS). They consist of various activities that teach phonetic word-attack strategies to promote automaticity in word recognition. Macaruso, Hook, and McCabe (2006) evaluated after adjusting for initial pretest differences, the mean effect size for Title 1 students was +0.67.

Captain's Log and Destination Reading

Rabiner et al. (2010) carried out a randomized trial to examine the effectiveness of two computer-based interventions for students with attention difficulties: Captain's Log and Destination Reading. Captain's Log is a commercially available product that provides structured opportunities for exercising attention. Destination Reading is a popular computer-assisted program that targets five key skills: phonemic awareness, phonics, fluency, vocabulary, and comprehension. Students in the Captain's Log group scored higher than the controls on two reading outcomes measures: DIBELS fluency (ES=+0.69) and WJ-III reading (ES=+0.10), with a median effect size of +0.40. On the other hand, the Destination Reading group scored only slightly higher than the controls: DIBELS fluency (ES=+0.10) and WJ-III reading (ES=+0.13), with a median effect size of +0.12.

Thinking Reader

Thinking Reader, a software program designed to help improve the reading vocabulary and comprehension of students in Grade 5-8 using a reciprocal teaching

approach. After a randomized study conducted by Drummond et al. (2011) treatment

students in the lowest achieving group (n=425) scored non-significantly higher than

their counterparts in the control group (n=383) on both GMRT-Vocabulary and GMRT-

Comprehension with effect sizes of +0.14 and +0.13, respectively.

READ 180

READ 180 is an intervention program for upper-elementary, middle, and high

school students who are struggling with reading. The program was originally developed

by Hasselbring and Goin (2004) at Vanderbilt University and is currently marketed by

Scholastic. Slavin, Lake, and Groff (2008) found positive effects for READ 180 in middle

schools (with a weighted mean effect size of +0.24 across eight studies). Two recent

randomized studies with struggling readers at the elementary level were included in this

review. In a research study by Papalewis (2004), the impact of the Read 180 program on

eighth graders was assessed. The researcher found that the students using the Read 180

program made significant gains of more than three normal curve equivalents in reading

and almost two normal curve equivalents in language arts using the Stanford

Achievement Test. Although, different measures are used to compare growth in this

study, all three groups in the present study made gains in their reading achievement. A

review of adolescent reading programs was conducted by, Slavin, R., Cheung, A., Groff,

C., & Lake,C. (2008) and they found the Read 180 program to be one of four adolescent

literacy programs that showed more evidence of effectiveness than the 128 other

programs reviewed.

System 44

System 44 Next Generation is a program to help students master the foundational

reading skills required for success with the Common Core through explicit instruction in

phonics, comprehension, and writing. System 44 integrates principles of cognition and

learning with practices for instructional effectiveness for older struggling readers.

System 44 uses a personalized learning progression with explicit, research-based

phonics instruction. Explicit teacher-led instruction in close reading, comprehension,

academic vocabulary, and writing provides students with the skills needed to succeed

with the Common Core, college and career. Jones (2011) reported most students

demonstrated that the Read 180/System 44 program increased their reading levels. All

groups displayed growth. The "at risk" general education program displayed the most

significant growth.

<div align="center">Motivation and Technology</div>

Researchers who have struggled with questions of what motivates students

generally recognize two major types of motivation: intrinsic and extrinsic. Intrinsic

motivation is the desire to do or achieve something because one truly wants to and

takes pleasure or sees value in doing so. Extrinsic motivation is the desire to do or

achieve something not for the enjoyment of the thing itself, but because doing so leads

to a certain result (Pintrich, 2003). Some refer to this divide as the difference between

true motivation and "engagement," or simply holding one's attention. This is something

teachers are often reminded. There is a difference between students being compliant

<div align="center">35</div>

because they like or respect you and students being truly engaged in the lesson. One can argue what true engagement really looks like.

What we do know is that student engagement is critical to student motivation during the learning process. The more students are motivated to learn, the more likely it is that they will be successful in their efforts. Some factors that play an important role in student motivation are teacher motivation and skills, parental involvement and the effective use of technology. Technology provides opportunities for teachers to meet the needs of students with various learning styles through the use of multiple media (Bryant & Hunton,2000).

Some argue that the new generation, that does not remember life without technology, are more academically unmotivated because schools have been slow to adapt. They contend that even more students will lose academic motivation as schools continue to teach topics and skills in which students have no interest or see no value in their lives; ask students to re-learn or forgo skills, such as surfing the internet or using social media, that they regularly use in their after-school hours; and cut off students from the much wider world with which they are used to interacting, thereby undermining relatedness (Prensky, 2008).

Tillman (2010) examines the debate of computer technology in the classroom. Not many researchers dispute the idea that computer technology in the classroom enhances teaching and learning; however, there is a debate as to whether or not a direct link between motivation and academic achievement exists. Based on Tilman's research, advocates of CAI (Chaika, 1999; Chang, 2002; Cotton, 2001; Garcia & Arias,

2000; Reeves, 1998; Schacter, 1999) claim that using CAI enhances learning through the overall positive motivational factors associated with technology integration into the curriculum. These CAI supporters indicate that CAI improves achievement through increased motivation. Cotton (2001) and Roblyer, Castine, and King (1989) claim in their extensive research reviews that CAI boosts positive attitudes of students toward learning. Similarly, in a meta-analysis of 500 studies, Kulik (1994) found that CAI increased the positive attitudes of students toward learning, which resulted in increased learning. Other researchers note that CAI improves school attendance (Cotton).

In a study by Usher and Center on Education (2012), real-world applications of technology along with other academic subjects help motivate students. They found that when technology-based inquiry-learning correlates to real-world situations, students begin to see the intrinsic value of what is being learned, which increases interest and motivation by the student. In addition, by applying abstract ideas into real-world situations, students can understand complex concepts, which will then increase competence. By adding technology into the classroom, teachers can utilize this technology to differentiate instruction, motivate students, and include all skill levels.

Only a few researchers, such as Ashton, Bland, & Rodgers (2001), report conflicting research on student motivation and CAI. After reviewing these studies, it appears that more researchers conclude there is a correlation between positive motivation toward learning results from CAI. Could this be the missing link to help increase reading achievement in students.

What is the i-Ready Intervention?

Students begin the program by taking a reading diagnostic assessment to assess skills in the following domains: phonological awareness, phonics, high-frequency words, vocabulary, literature and informational comprehension. Once students finish the diagnostic, the results are used to provide customized and differentiated instruction to meet their individual needs. Students will begin on their level and work through individualized skill-based instruction. After each unit, they will take a quiz to assess their knowledge and see if they mastered the skill. If they did not master the skill they will have to continue to work on that skill. If students continue to fail at the skill then teachers will be notified and will have to intervene in order to provide further instruction. This is where the role of the teacher comes in. Teachers should be progress monitoring and step in when students are shut-out of their domain, meaning they could not master it after three attempts. Workbooks with further practice are provided for teachers to use in one-on-one targeted instruction. If students continue to master the skills and move on, then teacher assistance is not necessary. i-Ready is currently being used by nearly 15 percent of all K-8 students nationwide across all 50 states.

Reading Achievement

The Curriculum Associates have gathered extensive research on the effects of i-Ready on reading achievement. The Curriculum Associates, LLC (2014) showed the effects of i-Ready on an already high preforming school. The percentage of students scoring at or above grade level more than doubled for most grades. In reading, the increase in average test scores from test 1 to test 2 was also statistically significant. In

fact, after 6 months the national percentile rank for grade 4 students increased by 20%. Another study in Farmington Elementary School showed 75%–88% pass rate for Tier 2 students after none passed last year and a 72% increase in students at or above grade level in reading. In Springfield Elementary School, Ohio there was a 20% increase in reading national percentile rank and a 37-scale score point increase in reading. In Edward Kemble Elementary, CA there was an 87% increase in students on or above grade level in reading and a 145-point increase in Lexile measure. In Montgomery County schools, North Carolina implemented a blended model of Ready and i-Ready. K5 students have seen growth of more than 50 percent in math and have closed significant gaps in reading ability. Using i-Ready Diagnostic data from over four million students who took the i-Ready Diagnostic in the 2016–2017 academic year, The Curriculum Associates found that students using i-Ready Instruction experienced greater learning gains than students who did not use the program. Learning gains for those students receiving i-Ready Instruction were substantial. Students receiving i-Ready instruction experienced average gains of 39% for English language arts (ELA) across grades K–8. Measured effect sizes were generally strong by the standards of an educational intervention (Cohen's d of greater than .25). Todtfeld and Weakley (2013) did not have the same results. Their findings do not indicate that the i-Ready program is effective in raising Communication Arts MAP (Missouri Assessment Program) test scores in all grade levels. Out of three grade levels studied, only third graders showed a statistically significant difference in MAP Communication Arts scores when the i-Ready intervention was used.

Differentiation

The Curriculum Associates, LLC (2004) focused on the question, Does i-Ready work for everyone? They first began with Public School 1/Courtland School in Bronx, NY had a very diverse student population—a number of special needs students, a rather large English language learner (ELL) population, and a wide range of ability levels in their general education classrooms. There was a 143% increase in students on or above grade level in math and 118% increase in students on or above grade level in reading. This shows the success i-Ready can have on a Title 1 underprivileged school. PS 49 Willis Avenue showed similar results. i-Ready became a stepping stone for differentiation for students who have been identified as needing intervention. Their results showed a 275% increase in students on or above grade level in reading and a 25-scale score point increase.

The Curriculum Associates, LLC (2014) then studied the effect of differentiation and engagement through i-Ready on student reading levels. The study focused on 2nd and 4th graders at PS 49 in the Bronx, NY. There was a 275% increase in students on or above grade level in reading and a 25-scale score point increase.

Engagement

The most recent research study was done by Alicia M. Federico (2017) explores how students interact with the educational program i-Ready. A double-entry journal was used to document data regarding the lessons students were working on, things that were said, facial expressions, and body language. The results found that students had more negative experiences and off task behaviors than positive experiences and on task

behaviors when using i-Ready, positive experiences do not lead to on task behaviors, i-Ready does not provide opportunities for student choice, and i-Ready does not support the development of 21st century skills. There is not enough research done to show if i-Ready motivates students to want to continue the program.

What is the Word Generation Program?

Word Generation is a 24-week sequence that introduces five new words a week by embedding them in brief texts about controversial issues of interest to many adolescents. Each week there is a different controversial issue that students discuss. Students begin the week on Monday in English Language Arts class where the five words and definitions are introduced to them. Students will practice using the words in turn and talk activities. Then students will read the passage where these words and embedded. This article also included evidence for both sides of the issue they are discussing. On Tuesday, students will then be introduced to the words and topic in Mathematics class. Here they will solve a word problem in which the words are included. On Wednesday, students will then look at an experimental design that includes more evidence about the topic and the five words. On Thursday, students engage in a debate where they choose sides and present their argument and evidence. They must use the five academic vocabulary words in their debates. Finally, on Friday, students will then choose a side and write about their position including all five academic vocabulary words. Teachers will grade the writing based on the accuracy and usage of all five words.

SERP explains that most of the target words for each week are drawn from the Academic Word List (AWL), which was originally developed as a support for instruction to second language learners of English. The Academic Word List has compiled well-

organized sublists of word families that occur with frequency in academic texts across

academic domains. They believe that the subset of AWL words they have selected for

Word Generation are particularly useful for students to know. Even if students have

some prior exposure to some of these words, they may not understand their meanings

in those academic contexts. For example, SERP has found that many students know only

one meaning for the words substitute and suspend -- a substitute teacher, and

suspended from school. Yet these words are just two examples of high-frequency, high-

importance, broadly useful words that deserve sustained attention so that they can be

understood (and used) across contexts.

Academic Vocabulary

Beck, McKeown, and Kucan's (2002) Three Tier Model places vocabulary words

into three categories: Tier 1 which consists of basic or common words, Tier 2 which

involves words that are used across the curriculum and multiple meaning words, and

Tier 3 which is content specific vocabulary. Tier 1 words are the most common words

found in the English language and require little to no instruction, e.g., dog, car, cat,

chair. They are sight words, function words, and words that name objects. These make

up the greatest amount of words that students are exposed to. Tier 2 words are high

frequency words that are important to understanding the text and are used across the

curriculum. For example, analyze, compare, and conclusion are words commonly used

in academic settings during instruction, in discussions, on tests, and in assignments.

Multiple meaning words such as set, bat, base, and check have several meanings and

must be presented in context in order to be understood. Students who are proficient in

English typically have a better grasp of these words and are able to use them to communicate. (Sibold, 2011). Tier 3 vocabulary words are found with less frequency and are typically limited to specific content areas. According to Vacca and Vacca (2008) these words have "usage and application only in a particular subject field," e.g., centimeter, kilogram, and deciliter in a mathematics or science class, or abolitionist, emancipation, and secession in a history class (p. 145). Since these words are not part of everyday language, students struggle to define or explain the meaning of them. Therefore, this technical vocabulary needs to be taught explicitly and thoroughly (Vacca & Vacca, 2008).

History explains, the first principle of effective vocabulary instruction is to teach words students need to know in order to comprehend the text they are assigned. For example, teachers are known to give students vocabulary words defined for them or to have students look up words they do not understand. This only enables them to better understand the text in front of them, not create a lifelong understanding of the word or its usage. Middle school students are expected to read content-area texts that contain many technical, discipline-specific words as well as many "all-purpose academic words." This latter category of words is less likely to be explicitly taught, in particular by math, science, and social studies teachers who concentrate their instructional time and effort on the words of their respective disciplines (Coxhead, 2000). The study found that the 60 most frequent general academic words on the AWL account for roughly 12 words per page in academic texts at the college level. While there is no published empirical research on the exact frequency of general academic words in middle school texts,

there is little debate that words from the AWL, as well as other words that fit the

characteristics of general academic words, do appear with considerable frequency in

middle school texts.

Bailey (2007) defines being academically proficient as "knowing and being able

to use general and content-specific vocabulary, specialized or complex grammatical

structures, and multifarious language functions and discourse structures—all for the

purpose of acquiring new knowledge and skills, interacting about a topic, or imparting

information to others" (pp.10–11).

<div align="center">**Vocabulary Acquisition Strategies**</div>

According to SERP, A few important strategies have been identified by research

as important tools for vocabulary instruction. For word learning to occur, instruction

should focus on words in such a way as to encourage multiple exposures, meaningful

use, polysemy, structural analysis, and cognate identification.

Multiple exposure. Researchers have also found that students are more likely to

truly retain the new words they learn if they are exposed to them multiple times (Beck,

McKeown, & Kucan, 2002). These exposures should not be memorization exercises, but

rather meaningful interactions with words in a variety of different contexts. Word

learning happens naturally in context, so word learning that repeatedly mimics context-

type word learning is likely to be effective (Stahl, 1999). Students should think actively

about what words mean and how those words connect to other words (McKeown &

Beck, 2004). By using words to discuss meaningful ideas and issues, students are more

likely to develop a deep sense of what the words mean.

Polysemy words. Polysemy Words have multiple meanings which are often unrelated or tangentially related, and these meanings should be introduced to students. If a word appears more frequently in a language, it is more likely to have multiple meanings (Nagy & Scott, 2000). Providing access to these meanings and direct instruction about when these various meanings are applicable and how they might differ in context will help students develop deeper understanding of words.

Structural analysis. Reading researchers have found that teaching students to recognize the various elements of a word is a highly effective means of expanding their vocabularies (Nagy, 1999). This structural analysis can examine word parts such as prefixes and suffixes. Building a repertoire of these smaller word chunks can help students develop a "toolbox" of information to understand the meanings of less familiar words.

Cognate identification. Cognates are words in two language that share similar meaning, spelling, and pronunciation. Cognates are a good source of information for English language learners, especially for individuals whose first language is Spanish. Reliance on cognates can be a useful strategy for students to understand both the passages they are reading and the words they are attempting to learn.

Research

In 2010, SERP was awarded a five-year grant by the Institute of Education Sciences (IES) under the Reading for Understanding Initiative to develop and evaluate programs intended to boost the reading comprehension of students across subject areas in grades 4-8. The overall purpose of this project was (1) to better understand the

roles of perspective taking, complex reasoning, and academic language skills in reading comprehension for upper elementary and middle school students, and (2) to refine, develop, and test the efficacy of Word Generation. The CCDD project expanded the original Word Generation program, now called WordGen Weekly, to include WordGen Elementary (cross content area units for 4th and 5th grades), as well as Science Generation (SciGen) and Social Studies Generation (SoGen), in-depth content area units for middle grades.

The study, a large-scale randomized trial across four districts, was conducted during the 2012-2013 and 2013-2014 school years. Twenty-five schools were randomized within pairs that were matched on multiple variables (such as size, socio-demographic characteristics, etc.), and 7,773 students in grades 4-7 participated in the study. Fourth and fifth grade treatment classrooms were provided WordGen Elementary materials. Middle grades treatment classrooms were provided a selection of units from the original Word Generation program (now called WordGen Weekly) and grade-specific Social Studies Generation and Science Generation units (Jones, et al., under revision).

The results show, elementary students made significant gains in taught vocabulary, perspective articulation and positioning skills, academic language skills, and deep reading comprehension, while students in the middle grades showed significant gains in taught vocabulary, perspective positioning skills, and deep comprehension. Impact analyses using multilevel models with school pair fixed effects revealed a positive impact of WordGen on the most proximal outcome, students' WordGen Vocabulary test scores, for both elementary (Grade 4-5) and middle grade (Grade 6-7)

cohorts in both Year 1 and Year 2. There were not significant impacts on any other outcomes in Year 1. However, in Year 2, there were significant impacts on perspective positioning, academic language, and deep reading comprehension for 4th and 5th grade students and for perspective positioning in 6th and 7th grade.

Another study shows, the effects of the Word Generation intervention program on student learning of words taught are significant but small (effect size of about 0.1). On average, students in control schools improved 1.46 points on the test of WG vocabulary, while students in treatment schools improved roughly 2.37 points. The small main treatment effect on taught vocabulary confirms the difficulty of finding big effects of programs implemented across schools and districts with varying levels of commitment to the program and with varying quality and intensity of implementation. Much more interestingly, in control schools there is a relationship both within schools and between schools of pretest WordGen vocabulary knowledge to improvements in general vocabulary and reading comprehension, which is blocked in schools participating in the Word Generation program. These models suggest that although all students and schools participating in the Word Generation program improve on WordGen vocabulary (on average), the impact is differential across students: the same improvement in WordGen Vocabulary will have stronger cascading effects on low-baseline students' general vocabulary skills. (Lawrence, et., 2017)

According to Lin (2014), the study provides evidence that exposing students to learning and discussing controversial issues through the Word Generation program can positively impact students' self-reported civic engagement. This study reveals that

curricula emphasis on controversial issues can improve classroom discussion quality, which can be an engaging experience for students and teachers.

Learning Classifications

Students across New York are usually classified under subgroups based on their level of overall achievement in English and Mathematics. These categories are general education, special education students (SWD) and English language learners (ELL). General education students are on or approaching grade level. Special education students and English language learners are below or far below grade level.

In many schools, without the correct tools and funding, it is nearly impossible to meet the needs of every single student. General education classes are regular pace and students read texts on grade level. Special education students require an Individualized Education Program (IEP). This contains specific interests, needs, goals, and education program for that student. The education program and goals created are monitored by a special education teacher. can be placed in a general education classroom if they only receive special education teacher support services (SETTS). Other special education students are placed in an Integrated Co-teaching (ICT) setting. This is a class that has a 60-40 mix of general education students and special education students. This class has a special education teacher that differentiates to meet the goals and medications listed on each student's IEP. ELL students can be described based on their proficiency level, as seen in table 6.

Table 6 Description of English Language Proficiency Level- New York State Education

Department

Level	Description of English Language Proficiency Level
Entering (Beginning)	A student at the Entering level has great dependence on supports and structures to advance academic language skills and has not yet met the linguistic demands necessary to demonstrate English language proficiency in a variety of academic contexts (settings).
Emerging (Low Intermediate)	A student at the Emerging level has some dependence on supports and structures to advance academic language skills and has not yet met the linguistic demands necessary to demonstrate English language proficiency in a variety of academic contexts (settings).
Transitioning (Intermediate)	A student at the Transitioning level shows some independence in advancing academic language skills, but has yet to meet the linguistic demands necessary to demonstrate English language proficiency in a variety of academic contexts (settings).
Expanding (Advanced)	A student at the Expanding level shows great independence in advancing academic language skills and is approaching the linguistic demands necessary to demonstrate English language proficiency in a variety of academic contexts (settings).
Commanding (Proficient)	A student at the Commanding level has met the linguistic demands necessary to demonstrate English language proficiency in a variety of academic contexts (settings). He or she is not an ELL.

Currently, New York State offers two approved program models for ELLs in state school districts: Bilingual Education and English as a New Language (ENL) Program (formerly known as English as a Second Language or ESL). Both program models support the academic achievement of ELLs, but the instructional time spent in the home or primary language and in English differs in each model.

Interventions based on classifications

As the classifications or subgroups are the same throughout New York schools, the interventions being used are different. A multi-tier system of supports (MTSS) is a framework that many schools use to provide targeted support to struggling students. It focuses on the "whole child." MTSS supports academic growth and achievement, but it also supports areas such as behavior, social and emotional needs, and absenteeism.

Positive Behavioral Interventions and Supports (PBIS) is a school- wide system. Students

are taught positive behavior expectations. They are rewarded for meeting the

expectations. Response to Intervention focuses on academics. Schools have been using

the Response-to-Intervention (RTI) model to identify and target the needs of all

students. Tiered instruction represents a model in which the instruction delivered to

students varies on several dimensions that are related to the nature and severity of the

student's difficulties. Typically, RTI models consist of three tiers of instructional

processes, although some models discuss an additional fourth tier and other models

subdivide the tiers into smaller units.

Tier 1

At Tier 1, considered the key component of tiered instruction, all students

receive instruction within an evidence-based, scientifically researched core program.

Usually, the Tier 1 program is chosen individually by each school from core reading or

math curriculums that are aligned to the state standards. The goal of the program is that

high-quality instruction is being delivered to develop the skills outline in the state

standards. Evert student receives Tier 1 instruction in the general classroom setting.

Tier 2

Tier 2 consists of children who fall below the expected levels of achievement and

are at risk for academic failure but who are still above levels considered to indicate a

high risk for failure. The specific needs of the students are identified through the

assessment process, and instructional programs are delivered that focus on their

specific needs. Students will receive targeted support in small groups, consisting

anywhere from 5 to 8 children. Interventions at Tier 2 involve instructional programs that are aimed at a level of skill development considered to be further along the continuum of skill acquisition than that seen at Tier 3. For example, a student placed in a Tier 2 reading program may already have well-developed skills in phonics and alphabetic principles but may be lacking with the development of fluency in reading connected text. However, a similar student could be identified at high risk because they lack the more foundational skills of decoding and need intensive work on phonics. This student needs a more targeted intervention than a Tier 2 program.

Tier 3

A student under these circumstances will need a Tier 3 program. Tier 3 consists of children who are considered to be at high risk for failure and, if not responsive, are considered to be candidates for identification as having special education needs. Tier 3 interventions consist of small group sizes, ranging from 3 to 5 students, with some models using one-to-one instruction. This is the highest level of intervention.

One size fits all approach

When it comes to literacy interventions there is a "one size fits all" approach. Since interventions were created to help students who are struggling many believe that any intervention should be able to help. The approach in many schools today is, if we give students any intervention they are exposed to more reading, so it can only help not hurt. The reality is, there are so many various interventions that it is nearly impossible to match every student to the perfect intervention for them. Unfortunately, in a classroom of thirty students and one teacher, it is hard to provide every student with

the intervention they need. This is when schools give every student in the class the

same intervention so that they can say they are meeting the needs of students and

providing a tier II support. This might work for students that are approaching or on

grade level, but what about the students far below and far above. The students that are

far below, for example, our special education and English language learners will not get

the basic help they are lacking. Students can be below grade level because they are

lacking skills in phonics, alphabetic principles, fluency or decoding. They need targeted

small group interventions. On the other hand, most interventions only accommodate

students up to a certain reading level, therefore, students that are above reading level

will not benefit from these interventions and in some studies actually regressed. The

way to use interventions successfully is by administering reading comprehension tests

and screeners to determine where each student is lacking in reading. Then these

students can be grouped by their needs and provided small group Tier II and Tier III

interventions. Another hiccup in this process is the lack of definite studies showing

which interventions work best with each type of learner. There are many interventions,

such as Just Word and Wilson, that have been around a long time that provide teacher

led instruction. There are also newer interventions, such as i-Ready, that are online and

are used for engagement purposes as well. It is important to understand the needs of

each child and the type of intervention that works best for them. At the same time, it is

important to progress monitor the interventions to see when students might need a

new or different intervention. According to Dodge and Ortlieb (2016), beyond this,

literacy instruction must have multiple entry points and content that is accessible and of

interest to students from varied backgrounds and learning styles. Their research defends

the concept of "one size fits none". They explain, the problem lies in failing to

contextualize or connect these teaching strategies with an individual's amazing

repertoire of existing knowledge, experiences, and interests. Looking at multiple

theories in relation to diverse learners may offer insight into how educators can provide

optimal literacy instruction for diverse learners.

Chapter III: Methodology and Procedures

This study evaluated the effectiveness of the i-Ready intervention compared to the Word Generation (WordGen) intervention in middle school English Language Arts classrooms. New York State test scores were used to determine which intervention group showed more growth. In addition, subgroups were studied to determine if certain subgroups showed more growth based on the different interventions they received. Results can provide educators and parents with information about the effectiveness of both interventions. It may also help educators when selecting interventions for certain subgroups. The level of analysis is the student group, distinguished from one another by SWD, GenED, or ELL (in addition to the treatments i-Ready and WordGen).

Participants

Participants were based on quota sampling. This is a secondary data analysis of existing publicly available data. The researcher collected school and grade level data that is listed on a public NYC website. This data was gathered as a part of regular assessment and data collection by the state. Participants were a sample of 1324 students, in a middle school in New York, over 2 school years. Participants also had different tiered levels such as ELL, special education and general education. Students who were classified as ELL are learning English as a new language. They received extra services inside the English classroom to help them learn the language. Students with a special education classification had an Individualized Education Program that helped them with their specific disabilities. There was a Special Education teacher in all core content area classes that provides accommodations for these students. General

education students did not receive any extra accommodations. The classroom was a student-centered classroom. Table 7, table 8 and table 9 show the breakdown of the participants. In the 2017-2018 school year, 662 total students were given the 7th grade English Language Arts exam. Forty-four percent of the population tested were female and 56% were male, 21% were classified as special education students and 12 % of the population were classified as ELL. These students received the i-Ready intervention. During the 2018-2019 school year, these same students became 8th graders. As 8th graders, they received the Word Generation intervention. Six hundred and fifty-six total students were given the 8th grade English Language Arts exam. Forty-five percent of the population tested were female and 55% were male, 20% were classified as special education students and 6% of the population were classified as ELLs. During the 2018-2019 school year, the 7th graders also received the Word Generation intervention and the i-Ready intervention the year before. Six hundred and sixty-two total students were given the 8th grade English Language Arts exam. Forty-eight percent of the population tested were female and 52% were male, 20% were classified as special education students and 12% of the population were classified as ELLs.

Table 7
Summary of 7th grade Participants during the 2017-2018 school year

Categories of Students i-Ready	Percentage of Students
Total students	662
Special Education	21%
ELL	12%
Female	44%
Male	56%

Table 8
Summary of 8ᵗʰ grade Participants during the 2018-2019 school year

Categories of Students Word Generation	Percentage of Students
Total students	656
Special Education	20%
ELL	6%
Female	45%
Male	55%

Table 9
Summary of 7ᵗʰ grade Participants during the 2018-2019 school year

Categories of Students Word Generation	Percentage of Students
Total students	662
Special Education	20%
ELL	12%
Female	48%
Male	52%

Setting

The study site was a middle school located in a residential and commercial

community in the borough of Queens right outside New York City. The School District

represents 55 schools serving students in grades pre-K-12 that are geographically

located in the borough of Queens, New York. The District is comprised of 26 elementary

schools; 7 middle/intermediate/junior high schools; 6 K-8 schools; 1 secondary school;

15 high schools; and 0 K-12 school. Additionally, there are 2 charter schools in the

district. The District serves a population of approximately 58,603 students from

culturally diverse backgrounds, and the District's community is home to many new

immigrants from Latin America, Asia and the Middle East. According to the latest

available demographic data (2016-2017) 0% of the students are American Indian/Alaska

Native; 20.1% are Asian or Pacific Islander; 2.7% are Black or African American; 62.2%

are Hispanic or Latino, 1.1% are multi-racial, and 13.9% are White. Approximately 16% of the students have Individualized Education Plans (IEPs) and receive the full continuum of special education services including Special Education Teacher Support Services (SETSS), Integrated Co-Teaching (ICT) classes and other models of integrated inclusion classes, instruction in self-contained classes, and related services such as speech and language, counseling, and adaptive physical education. Additionally, 22.3% of the students are English language learners (ELLs), with Spanish as the dominant language among the vast majority. 4.77 % (2015-16) of students in the District are Students with Interrupted Formal Education (SIFE).

Approximately 67% of students qualify for free and reduced lunch. Approximately 6.80% of students are in temporary housing (STH). Of the 55 schools in the district, 45 are Title I eligible, 45 schools are implementing Title I School Wide Programs (SWP), and no schools are designated as Title I Targeted Assistance Schools (TAS). The average student attendance rate for the district in 2016-7 was 93.06%. The average Superintendent's suspension rate for District 24 in 2015-16 was 0.40%. Additionally, none of the schools were identified by NYSED as Persistently Dangerous. Approximately 95.98% (2015-16) of teachers in District 24 are deemed to be highly qualified in their area of assignment in core subject areas. The percentage of teachers holding a Master's Degree plus 30 hours or a Doctorate is 51%. The percentage of teachers in the district rated effective/highly effective is 96.71%.

To protect the privacy of the participants and the school district, the pseudonym Franklin was used throughout the study. This district was chosen due to the professional

relationship the researcher had as a teacher. Choosing this site allowed the researcher to use her own school and ensure there was consistency in the curriculum being taught.

Research Questions

R1. Is there a statistically significant difference for ELA test scores on the NYS Common Core Exam between students who receive the i-Ready intervention and students who received the Word Generation intervention?

- H1. Students who receive the i-Ready intervention will score higher on the New York ELA test scores on the NYS Common Core Exam than students who receive the Word Generation intervention.

R2. Is there a statistically significant difference between ELA test scores on the NYS Common Core Exam for certain subgroups (i.e., general education, special education, English language learners) of students who received the i-Ready intervention and/or the Word Generation intervention?

- H2. Special Education students who received only the i-Ready intervention will show the most growth on the New York ELA state test.

Research Design and Sample

This study used a pre-experimental, cross-sectional research design. Quantitative designs deal with numbers and anything that is measurable in a systematic way of investigation of phenomena and their relationships. It is used to answer questions on relationships within measurable variables with an intention to explain, predict and control phenomena. (Leedy,1993). The design is pre-experimental (versus quasi-experimental) due to the fact that there is no pretest and that the treatments were not randomly assigned, which is common across and unavoidable for studies of educational

evaluations of student performance on standardized tests (Trochim, 2010). However,

the design is not susceptible to either simultaneity bias or mono-source bias given that

the treatments occurred before the standardized testing occurred (Trochim, 2010). The

researcher used data from students at Franklin Middle School, who took the ELA state

test, collected over two school years (see Tables 10-21 below).

Table 10

The progression of 7th grade students receiving i-Ready in 2018 compared to the same

students as 8th graders receiving Word Gen in 2019

Population	Year	Grade	Intervention
All students	2018	7th graders	i-Ready (no intervention in 6th grade)
All students	2019	8th graders	Word Generation (and i-Ready in 7th grade)

Table 11

7th grade students receiving i-Ready in 2018 compared to 7th grade students receiving

Word Gen in 2019

Population	Year	Grade	Intervention
All students	2018	7th graders	i-Ready (no intervention in 6th grade)
All students	2019	7th graders	Word Generation (and i-Ready in 6th grade)

Table 12

7th grade SWD receiving i-Ready in 2018 compared to 7th grade Not SWD receiving i-

Ready the same year

Population	Year	Grade	Intervention
SWD	2018	7th graders	i-Ready (no intervention in 6th grade)
Not SWD	2018	7th graders	i-Ready (no intervention in 6th grade)

Table 13

8th grade SWD receiving Word Gen in 2019 compared to 8th grade Not SWD receiving

Word Gen the same year

Population	Year	Grade	Intervention
SWD	2019	8th graders	Word Gen (i-Ready in 7th grade)
Not SWD	2019	8th graders	Word Gen (i-Ready in 7th grade)

Table 14

7th grade SWD receiving i-Ready in 2018 compared to 7th grade SWD receiving Word

Gen in 2019

Population	Year	Grade	Intervention
SWD	2018	7th graders	i-Ready (no intervention in 6th grade)
SWD	2019	7th graders	Word Gen (i-Ready in 6th grade)

Table 15

7th grade SWD receiving Word Gen in 2019 compared to 7th grade Not SWD receiving

Word Gen the same year

Population	Year	Grade	Intervention
SWD	2019	7th graders	Word Gen (i-Ready in 6th grade)
Not SWD	2019	7th graders	Word Gen (i-Ready in 6th grade)

Table16

The progression of 7th grade SWD receiving i-Ready in 2018 compared to the same

students receiving Word Gen as 8th graders in 2019

Population	Year	Grade	Intervention
SWD	2018	7th graders	i-Ready (no intervention in 6th grade)
SWD	2019	8th graders	Word Gen (i-Ready in 7th grade)

Table 17

7th grade ELL receiving i-Ready in 2018 compared to 7th grade Not ELL receiving i-Ready

the same year

Population	Year	Grade	Intervention
ELL	2018	7th graders	i-Ready (no intervention in 6th grade)
Not ELL	2019	8th graders	Word Gen (i-Ready in 7th grade)

Table 18

8th grade ELL receiving Word Gen in 2019 compared to 8th grade Not ELL receiving Word

Gen the same year

Population	Year	Grade	Intervention
ELL	2019	8thgraders	Word Gen (i-Ready in 7th grade)
Not ELL	2019	8thgraders	Word Gen (i-Ready in 7th grade)

Table 19

7th grade ELL receiving i-Ready in 2018 compared to 7th grade ELL receiving Word Gen in

2019

Population	Year	Grade	Intervention
ELL	2018	7thgraders	i-Ready (no intervention in 6th grade)
ELL	2019	7thgraders	Word Gen (i-Ready in 6th grade)

Table 20

7th grade ELL receiving Word Gen in 2019 compared to 7th grade Not ELL receiving Word

Gen the same year

Population	Year	Grade	Intervention
ELL	2019	7th graders	Word Gen (i-Ready in 6th grade)
Not ELL	2019	7th graders	Word Gen (i-Ready in 6th grade)

Table 21

The progression of 7th grade ELL receiving i-Ready in 2018 compared to the same

students receiving ELL as 8th graders in 2019

Population	Year	Grade	Intervention
ELL	2018	7^thgraders	i-Ready (no intervention in 6th grade)
ELL	2019	8^thgraders	Word Gen (i-Ready in 7th grade)

Instrument and Variables

One instrument was used for this study is the New York state, English Language

Arts test exam. In order to find the test scores, the number of correct answers a student

gives are converted into the student's "scale score." Mean scale score for the ELA at the

cohort level of analysis will be used to operationalize student achievement as the

dependent variable. As seen in Table 22, the scores are then used to evaluate student

mastery of content and skill in various areas, measure the extent to which students are

on track to graduate high school and are college and career ready, and helps shape

further instruction. Schools distribute test results on Individual Parent Reports for each

family. The reports are also given to the students' past and current teachers to use for

targeted support and to show growth areas. The reports include the student's scale

score, performance level, and information on his or her strengths and weaknesses in the

different skill areas tested.

Table 22
Interpretation of the New York State, English Language Arts exam results

Performance Levels	Interpretation of levels
Level 1	Far below grade level standards
Level 2	Approaching grade level standards
Level 3	Meeting grade level standards
Level 4	Above grade level standards

Data analysis plan

The data analysis plan is as follows. First, each variable with which the hypotheses were tested were described in the standard way: N, mean, standard deviation, and range. Next, the dependent variable and models were tested for the assumptions of normality – to determine whether parametric or non-parametric tests of the research hypotheses are required. Then, the hypotheses were tested using independent samples *t*-tests to compare the ELA scores between the same set of participants or two identified independent groups.

T-tests were used to test if there is a statistically significant difference between student groups based on the interventions that were given. The dependent variable was the student scores on the ELA state test that scored on or above grade level on the ELA state test. The independent variable was the intervention (i-Ready or Word Generation).

To test Hypothesis 1, the researcher tested for a statistically significant difference between interventions of i-Ready and Word Gen on the ELA. Specifically, I

conducted a series of paired samples t-test to compare the mean scale scores (subgroups within these groups are tested for statistically significant differences with Hypothesis 2). Accordingly, the mean scale scores for two groups were tested for statistically significant differences. Each difference of means was interpreted for statistical significance (p value of .05 or better), magnitude, and direction of effect.

Chapter IV: Results

Introduction

The purpose of this study was to evaluate the effectiveness of the i-Ready intervention compared to the Word Generation intervention in middle school English Language Arts classrooms. New York State test scores were used to determine which intervention group showed more growth. In addition, subgroups were studied to determine if certain subgroups showed more growth based on the different interventions they received. To address Research question 1 and Research question 2, the dataset was cleaned and transformed to ensure data completeness for data analyses. The independent variables in the study were the intervention type, education classification, as well as based on grade level. The dependent variable of interest was the mean ELA test score for 2018 and 2019. First, *intervention type* was a set of three mutually exclusive dichotomous variables detailing which intervention to which the student was exposed (i.e., i-Ready, Word Generation). Second, *education classification* was a set of dichotomous variables detailing which curriculum/curricula in which the student participates (i.e., GenEd, SWD, ELL).

The participants included 7th grade students in 2018 who were 8th grade students in 2019. The study design was posttest-only due to the fact that pretests before an educational intervention or comparative set thereof do not enhance internal validity insofar that the pretest would not exhibit any theoretically or statistically meaningful variation amongst the observations (Trochim, 2009). The analysis started a comparison of summary statistics for the variables included in the quantitative models

for Hypotheses 1 and 2. The first hypothesis (that there is a statistically significant difference in mean ELA test scores across the two *interventions*) was tested using independent samples *t*-tests. These analyses were used to test the second hypothesis as well (that there are statistically significant differences across the nine groups for every combination of *intervention* and *educational classification*. A discussion of the results concludes the chapter.

Research Question 1

Is there a statistically significant difference between ELA test scores on the NYS Common Core Exam for students who received the i-ready intervention and/or Word Generation intervention? To address this, the mean ELA scores were compared.

Table 23

Summary Statistics of ELA Test Scores for i-Ready and Word Gen using Same Set of

Participants

	N	M	SD	*t*	*p*-value
i-Ready in 2018 (7th Grade)	662	606	18.99	0	0.99
Word Gen in 2019 (8th Grade)	662	606	18.81		

The summary statistics in Table 23 (above) are for the 662 students who were in 7th Grade in 2018 and 8th Grade in 2019. A paired samples t-test was conducted to determine whether there is a difference between the ELA test scores for the i-Ready and Word Gen interventions. The results showed that the mean scores for both i-Ready and Word Gen are 606 while the standard deviation is slightly higher for i-Ready (SD = 18.988) as opposed to Word Gen (SD = 18.813). The result of the t-test determined that

the difference between the ELA test scores for the two interventions were not statistically significant for the same set of participants who were in 7th Grade in 2018 and 8th Grade in 2019. The results showed that there is no statistically significant difference between ELA test scores on the NYS Common Core Exam for students who received the i-Ready intervention in 7th Grade and the Word Generation intervention in 8th Grade. There was no growth shown from 7th to 8th grade.

Table 24

Summary Statistics of ELA Test Scores for i-Ready and Word Gen using Different Sets of Participants

	N	M	SD	t	p-value
i-Ready in 2018 (7th Grade)	662	606	18.99	0.000	0.99
Word Gen in 2019 (7th Grade)	662	606	19.83		

The summary statistics in Table 24 (above) are for the 662 students who were in 7th Grade in 2018 were compared to the 7th Grade in 2019. The 7th Grade in 2018 participants used the i-Ready intervention while the 7th Grade in 2019 participants used the Word Gen intervention. An independent samples t-test was conducted to determine whether there is a difference between the ELA test scores for the i-Ready and Word Gen interventions of 7th Graders in 2018 and 2019, respectively. The results showed that the mean scores for both i-Ready and Word Gen are 606 while the standard deviation is slightly higher for Word Gen (SD = 19.833) as opposed to i-Ready (SD = 18.988). The result of the t-test determined that the difference between the ELA test scores for the two interventions were not statistically significant for different sets of

participants who were in 7th Grade in 2018 and 7th Grade in 2019. The results showed that there is no statistically significant difference between ELA test scores on the NYS Common Core Exam for 7th grade students who received the i-Ready intervention and 7th grade students who received the Word Generation intervention. Therefore, both interventions yielded the same results. One cannot be said to have more success than the other. The results of the t-tests determined that there is no statistically significant difference between ELA test scores on the NYS Common Core Exam for students who received the i-Ready intervention and/or Word Generation intervention.

Research Question 2

Is there a statistically significant difference between ELA test scores on the NYS Common Core Exam for certain subgroups (i.e., general education, special education, English language learners) of students who received the i-Ready intervention and/or the Word Generation intervention?

Students with Disabilities

Table 25

Summary Statistics of ELA Test Scores for i-Ready Special Education (SWD) and Not Special Education Participants in 2018

			N	M	SD	t	p-value
SWD	i-Ready in 2018 (7th Grade)	no intervention in 6th Grade	139	590	13.28	-14.56	<.01
not SWD	i-Ready in 2018 (7th Grade)	no intervention in 6th Grade	523	610	17.96		

Table 25 shows the summary statistics of ELA test scores for i-Ready 7th Grade participants in 2018. An independent samples t-test was conducted to determine whether there is a difference in the ELA test scores of SWD and not SWD i-Ready participants in 2018. The mean ELA test scores for SWD participants is 590 (SD = 13.282) while the mean ELA test scores for not SWD participants is 610 (SD = 17.955). The results showed that there is a significant difference in the ELA test scores of SWD and not SWD 7th Grade participants who took the i-Ready intervention in 2018 (t = -14.56, p-value < .01). Not special education 7th Grade participants who took the i-Ready intervention have statistically higher ELA test scores as compared to special education 7th Grade participants who took the i-Ready intervention.

Table 26

Summary Statistics of ELA Test Scores Word Gen Special Education (SWD) and Not

Special Education Participants in 2019

			N	M	SD	T	p-value
SWD	Word Gen in 2019 (8th Grade)	i-Ready in 7th Grade	129	590	13.811	-13.94	<.01
not SWD	Word Gen in 2019 (8th Grade)	i-Ready in 7th Grade	527	610	17.488		

Table 26 shows the summary statistics of ELA test scores for Word Gen 8th Grade participants in 2019. An independent samples t-test was conducted to determine whether there is a difference in the ELA test scores of SWD and not SWD Word Gen participants in 2019. The mean ELA test scores for SWD participants is 590 (SD = 13.811) while the mean ELA test scores for not SWD participants is 610 (SD = 17.488). The

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results showed that there is a significant difference in the ELA test scores of SWD and not SWD 8th Grade participants who took the Word Gen intervention in 2019 ($t = -13.931$, *p*-value < .01). Not special education 8th Grade participants who took the Word Gen intervention have statistically higher ELA test scores as compared to special education 8th Grade participants who took the Word Gen intervention.

Table 27

Summary Statistics of ELA Test Scores of 7th Grade SWD Participants of i-Ready in 2018 and Word Gen in 2019

			N	M	SD	t	p-value
SWD	i-Ready in 2018 (7th Grade	no intervention in 6th Grade	139	590	13.283	1.195	0.23
SWD	Word Gen in 2019 (7th Grade)	i-Ready in 6th Grade	131	588	14.166		

Table 27 shows the summary statistics of ELA test scores for 7th Grade SWD participants who took the i-Ready intervention in 2018 and Word Gen in 2019. An independent samples t-test was conducted to determine whether there is a difference in the ELA test scores of 7th Grade SWD participants who took the i-Ready intervention in 2018 and Word Gen in 2019. The mean ELA test scores for i-Ready participants is 590 (SD = 13.283) while the mean ELA test scores for Word Gen participants is 588 (SD = 14.166). Although the ELA test scores for i-Ready participants were slightly higher, the results showed that there is no significant difference in the ELA test scores of 7th Grade SWD participants who took the i-Ready intervention in 2018 and Word Gen in 2019 ($t = 1.195$, *p*-value = .2332).

Table 28

Summary Statistics of ELA Test Scores of 7th Grade SWD and not SWD Participants of

Word Gen in 2019

			N	M	SD	t	p-value
SWD	Word Gen in 2019 (7th Grade)	i-Ready in 6th Grade	131	588	14.17	-15.65	<.01
not SWD	Word Gen in 2019 (7th Grade)	i-Ready in 6th Grade	531	611	18.27		

Table 28 shows the summary statistics of ELA test scores for Word Gen 7th

Grade participants in 2019. An independent samples t-test was conducted to determine

whether there is a difference in the ELA test scores of SWD and not SWD Word Gen

participants in 2019. The mean ELA test scores for SWD participants is 588 (SD = 14.166)

while the mean ELA test scores for not SWD participants is 611 (SD = 18.273). The

results showed that there is a significant difference in the ELA test scores of SWD and

not SWD 7th Grade participants who took the Word Gen intervention in 2019 (t = -

15.647, p-value < .01). Not special education 7th Grade participants who took the Word

Gen intervention have statistically higher ELA test scores as compared to special

education 7th Grade participants who took the Word Gen intervention.

Table 29

Summary Statistics of ELA Test Scores of 7th Grade SWD Participants of i-Ready in 2018

and 8th Grade SWD Participants of Word Gen in 2019

			N	M	SD	t	p-value
SWD	i-Ready in 2018 (7th Grade)	No Intervention in 6th Grade	139	590	17.95	0.000	0.99
SWD	Word Gen in 2019 (8th Grade)	i-Ready in 7th Grade	129	590	13.81		

Table 29 shows the summary statistics of ELA test scores for 7th Grade SWD participants who took the i-Ready intervention in 2018 and were in 8th Grade who took the Word Gen in 2019. An independent samples t-test was conducted to determine whether there is a difference in the ELA test scores of 7th Grade SWD participants who took the i-Ready intervention in 2018 and 8th Grade who took the Word Gen in 2019. The mean ELA test scores for I-Ready participants is 590 (SD = 17.955) while the mean ELA test scores for Word Gen participants is 590 (SD = 13.812). The results showed that there is no significant difference in the ELA test scores of 7th Grade SWD participants who took the i-Ready intervention in 2018 and the 8th Grade SWD participants who took Word Gen in 2019 ($t = 0.000$, p-value = .999). Overall, for SWD participants, a significant difference is determined between SWD and not SWD participants. However, there is no significant difference between the ELA test scores for i-Ready and Word Gen intervention participants.

English Language Learners

Table 30

Summary Statistics of ELA Test Scores for i-Ready English Language Learner (ELL) and

Not ELL Participants in 2018

			N	M	SD	t	p-value
ELL	i-Ready in 2018 (7th Grade)	No Intervention in 6th Grade	79	58 2	13.65	-16.39	<.01
not ELL	i-Ready in 2018 (7th Grade)	No Intervention in 6th Grade	52 3	61 0	17.17		

Table 30 shows the summary statistics of ELA test scores for i-Ready 7th Grade

participants in 2018 comparing English Language Learners (ELL) and not ELL participants.

An independent samples t-test was conducted to determine whether there is a

difference in the ELA test scores of ELL and not ELL i-Ready participants in 2018. The

mean ELA test scores for ELL participants is 582 (SD = 13.635) while the mean ELA test

scores for not ELL participants is 610 (SD = 17.28). The results showed that there is a

significant difference in the ELA test scores of ELL and not ELL 7th Grade participants

who took the i-Ready intervention in 2018 (t = -16.394, p-value < .01). Not ELL 7th Grade

participants who took the i-Ready intervention have statistically higher ELA test scores

as compared to ELL 7th Grade participants who took the i-Ready intervention.

Table 31

Summary Statistics of ELA Test Scores Word Gen ELL and Not ELL Participants in 2019

			N	M	SD	t	p-value
ELL	Word Gen in 2019 (8th Grade)	i-Ready in 7th Grade	40	577	10.61	-17.87	<.01
not ELL	Word Gen in 2019 (8th Grade)	i-Ready in 7th Grade	527	610	17.72		

Table 31 shows the summary statistics of ELA test scores for Word Gen 8th

Grade participants in 2019 comparing ELL and not ELL participants. An independent

samples t-test was conducted to determine whether there is a difference in the ELA test

scores of ELL and not ELL Word Gen participants in 2019. The mean ELA test scores for

ELL participants is 577 (SD = 10.61) while the mean ELA test scores for not ELL

participants is 610 (SD = 17.716). The results showed that there is a significant

difference in the ELA test scores of ELL and not ELL 8th Grade participants who took the

Word Gen intervention in 2019 (t = -17.872, p-value < .01). Not ELL 8th Grade

participants who took the Word Gen intervention have statistically higher ELA test

scores as compared to ELL 8th Grade participants who took the Word Gen intervention.

Table 32

Summary Statistics of ELA Test Scores of 7th Grade ELL Participants of i-Ready in 2018

and Word Gen in 2019

			N	M	SD	t	p-value
ELL	i-Ready in 2018 (7th Grade)	No intervention in 6th Grade	79	582	13.64	0.99	0.32
ELL	Word Gen in 2019 (7th Grade)	i-Ready in 6th Grade	81	580	11.78		

Table 32 shows the summary statistics of ELA test scores for 7th Grade ELL

participants who took the i-Ready intervention in 2018 and Word Gen in 2019. An

independent samples t-test was conducted to determine whether there is a difference

in the ELA test scores of 7th Grade ELL participants who took the i-Ready intervention in

2018 and Word Gen in 2019. The mean ELA test scores for i-Ready participants is 582

(SD = 13.635) while the mean ELA test scores for Word Gen participants is 580 (SD =

11.777). Although the ELA test scores for i-Ready participants were slightly higher, the

results showed that there is no significant difference in the ELA test scores of 7th Grade

ELL participants who took the i-Ready intervention in 2018 and Word Gen in 2019 (*t* =

.992, *p*-value = .3228).

Table 33

Summary Statistics of ELA Test Scores of 7th Grade ELL and not ELL Participants of Word

Gen in 2019

			N	M	SD	t	p-value
ELL	Word Gen in 2019 (7th Grade)	i-Ready in 6th Grade	81	580	11.78	-20.40	<.01
not ELL	Word Gen in 2019 (7th Grade)	i-Ready in 6th Grade	531	611	17.8		

Table 33 shows the summary statistics of ELA test scores for Word Gen 7th

Grade participants in 2019. An independent samples t-test was conducted to determine

whether there is a difference in the ELA test scores of ELL and not ELL Word Gen

participants in 2019. The mean ELA test scores for ELL participants is 580 (SD = 11.777)

while the mean ELA test scores for not SWD participants is 611 (SD = 17.8). The results

showed that there is a significant difference in the ELA test scores of ELL and not ELL 7th

Grade participants who took the Word Gen intervention in 2019 (*t* = -20.401, *p*-value <

.01). Not ELL 7th Grade participants who took the Word Gen intervention have

statistically higher ELA test scores as compared to ELL 7th Grade participants who took

the Word Gen intervention.

Table 34

Summary Statistics of ELA Test Scores of 7th Grade ELL Participants of i-Ready in 2018

and 8th Grade ELL Participants of Word Gen in 2019

			N	M	SD	t	p-value
ELL	i-Ready in 2018 (7th Grade)	No intervention in 6th Grade	79	582	13.64	2.20	0.03
ELL	Word Gen in 2019 (8th Grade)	i-Ready in 7th Grade	40	577	10.61		

Table 34 shows the summary statistics of ELA test scores for 7th Grade ELL

participants who took the i-Ready intervention in 2018 and were in 8th Grade who took

the Word Gen in 2019. An independent samples t-test was conducted to determine

whether there is a difference in the ELA test scores of 7th Grade ELL participants who

took the i-Ready intervention in 2018 and 8th Grade who took the Word Gen in 2019.

The mean ELA test scores for i-Ready participants is 582 (SD = 13.635) while the mean

ELA test scores for Word Gen participants is 577 (SD = 10.61). The results showed that

there is a significant difference in the ELA test scores of 7th Grade ELL participants who

took the i-Ready intervention in 2018 and the 8th Grade ELL participants who took

Word Gen in 2019 (t = 2.200, p-value = .0302). The results showed that students who received i-Ready in 2018 did slightly better than they did in 8th grade after receiving WordGen as well. Overall, for ELL participants, a significant difference is determined between ELL and not ELL participants. However, there is no significant difference between the ELA test scores for i-Ready and Word Gen intervention participants except for the progression of ELL participants from i-Ready in 2018 (7th Grade) and Word Gen in 2019 (8th Grade) who went down slightly.

Chapter V: Discussion, Limitations and Conclusion

Introduction

It is widely agreed that school systems treat students differently according to their race, social class, and gender. Presently, despite gains in educational opportunities, there are still significant gaps in academic achievement that persist among minority groups (Hackman, Farah & Meaney, 2010). Students across New York are usually classified under different categories, which are, general education (GenEd), special education (SWD), and English as a Second Language (ELL). It is within these groups that the researcher opted to conduct the study. The researcher compared the online reading program i-Ready to the Word Generation (Word Gen) program, which both focus on the reading and writing levels of New York City middle school students. This study compared the ELA test scores of students in these two programs for each of the aforementioned education classifications.

The i-Ready intervention program commences with students taking a reading diagnostic assessment to assess skills in the following domains: phonological awareness, phonics, high-frequency words, vocabulary, literature, and informational comprehension. Once students finish the diagnostic, the results are used to provide customized and differentiated instruction to meet their individual needs. Students begin on their level and work through individualized skill-based instruction. The Word Gen initiative follows a 24-week sequence that introduces five new words a week by embedding them in brief texts about controversial issues of interest to many students. Each week introduces a different controversial issue that students discuss, and the week starts on Monday in English Language Arts class where the five words and definitions are

introduced to the students. Following this class, they need to practice these by using them in sentences and oral activities through the week in all core content areas.

The goal of this study was to determine statistically which intervention positively affects ELA test scores, more, if at all, for a sample of middle school students in New York. The researcher adopted a quantitative correlation cohort research approach as a means to systematically investigate the relationships within measurable variables with an intention to explain, predict and control phenomena (Leedy,1993).

This chapter will further discuss the findings of the study and its implications. First, findings from the investigation of the research questions posed in the study will be discussed, including their relevance to the current literature. Next, implications for practice will be presented. Last, the limitations and future research considerations will be presented.

Research Question 1. Is there a statistically significant difference between ELA test scores on the NYS Common Core Exam for students who received the i-Ready intervention and/or Word Generation intervention?

In order to answer research question 1, the researcher determined the relationship between the specific intervention, the independent variable, and the state test score results, the dependent variable. A series of t-tests were run to determine if there is a statistically significant difference between intervention and non-intervention groups on ELA test scores on the NYS Common Core Exam for middle school students across two cohorts. The researcher performed separate tests for each grade (7th and 8th grades). The results enabled the researcher to test the hypotheses, stating that students

who received only the i-Ready intervention will show the most growth on the New York ELA state test.

Hypothesis 1 stated that students who received only the intervention I-ready would show more growth on the New York ELA state test than students who received the Word Generation intervention. This hypothesis was tested by comparing the mean scores for each group and these results showed that both intervention populations saw no noticeable difference in their test scores when compared, there was however no meaningful difference between the I-ready and Word Generation interventions. The suggestion formulated from these results was that even though participation in the interventions was important to academic achievement, the t-tests did not demonstrate differences in mean ELA test scores that are statistically significant, and therefore the null hypothesis could not be rejected.

Research Question 2. Is there a statistically significant difference between ELA test scores on the NYS Common Core Exam for certain subgroups (i.e., general education, special education, English language learners) of students who received the i-Ready intervention and/or the Word Generation intervention?

In order to answer research question 2, the researcher ran a series of t-tests to determine the statistical significance of differences across ELA test scores between being in either the i-Ready or Word Generation groups.

The researcher tested for statistically significant differences in ELA test score means across the 9 subgroups of student groups by running a t-test. The results from these tests, provided the answer to Research question 2 and showed that there was a

statistically significant difference in measurements across subgroups of student groups

(GenEd, SWD, ELL) and interventions received (I-Read and Word Generation). The

second hypothesis stated that special education students (SWD) who received only the

i-ready intervention would show the most growth on the New York ELA state test. What

was interesting in the findings of the research, was that the mean ELA test score for

SWD students receiving i-Ready (588.33) was not the highest of the 9 subgroups.

General Education (GenEd) students with Word Generation intervention had the highest

mean score (606.40), followed by GenEd students with i-Ready intervention (605.90).

The results were not statistically significantly different. Comparing the ELL subgroup

with the SWD subgroup the results actually show student scores went down after

receiving both interventions.

Interpretation of the Findings

A number of research studies conducted indicate that Computer Aided

Instruction (CAI) can offer an effective educational tool to help poor readers especially

when CAI is applied in an interactive instructional environment. Tillman (2004) pointed

to the large body of work linked to CAI, yet he argued that there is a much less research

devoted to the impact of CAI on reading instruction (Tillman, 2004).

Technology provides an opportunity for teachers to meet the needs of students

with various learning styles through the use of multiple media (Bryant & Hunton, 2000).

Based on Tilman's research, advocates of Computer Aided Instruction (Chaika, 1999;

Chang, 2002; Cotton, 2001; Garcia & Arias, 2000; Reeves, 1998; Schacter, 1999) claim

that using CAI improves learning through associated motivational factors by integrating

technology into the curriculum. In a study by Usher and Center on Education (2012), real-world applications of technology along with other academic themes showed positive motivation for students. These studies indicated that CAI improves achievement through increased motivation.

In a study by Usher and Center on Education (2012), real-world applications of technology along with other academic subjects help motivate students. They found that when technology-based inquiry-learning correlated to real-world situations, students begin to see the intrinsic value of what is being learned, which increases interest and motivation by the student. In addition, by applying abstract ideas into real-world situations, students can understand complex concepts, which will then increase competence. By adding technology into the classroom, teachers can utilize this technology to differentiate instruction, motivate students, and include all skill levels. Similarly, in a meta-analysis of 500 studies, Kulik (1994) found that CAI increased the positive attitudes of students toward learning, which resulted in increased learning. Other researchers note that CAI improves school attendance (Cotton). Cotton (2001) and Roblyer, Castine, and King (1989) claim in their extensive research reviews that CAI boosts positive attitudes of students toward learning. Ashton, Bland, & Rodgers (2001), reported conflicting research on student motivation and CAI, however, after reconsidering these studies, it shows that more researchers deduce that there is a relationship between positive motivation toward learning results from CAI. Could this be the missing link to help increase reading achievement in students? Ultimately, the take-

home message is that any intervention which exposes students to more reading and comprehension, is in itself beneficial.

According to Ivy and Fisher (2006), without access to high-quality, readable texts and instruction in strategies to read and write across the school day, it is doubtful that a specific, limited intervention will make much of a difference. In schools where students still have difficulty with reading comprehension after these fundamental changes have been implemented, the only alternative is for an intervention program such as i-Ready or Word Gen to be implemented. Students who received i-Ready instruction, experienced average gains of 39% for English language arts (ELA) across middle school grades. These gains were significant and a clear indicator of the success of the program.

The literature on multitiered, research-based reading interventions provides strong evidence for the critical role of early reading instruction and the benefits of early intervention for children who are struggling to learn to read (Denton, Fletcher, Anthony, & Francis, 2006).

Middle school students need to read content-related text which includes technical and discipline-specific words as well as many topic related academic words. While there is no published empirical research on the exact frequency of general academic words in middle school texts, there is little debate that words from the Academic Word List (AWL), as well as other words that fit the characteristics of general academic words, do appear with considerable frequency in middle school texts. Exposure to these words as part of an intervention program educates and prepares students for future application and overall understanding, expression, and literacy.

Classroom discussion and engagement between students and teachers, were also improved when controversial issues were incorporated into the curriculum.

Limitations of the Study

Since the researcher was not able to obtain student level data, it was more difficult to determine the growth for each subgroup. Not ELL and Not SWD, were not necessarily all general education students, they can also be higher levels like honors and Gifted and talented. Those sub groups were not addressed due to the lack of data given by the DOE.

The interventions were also not monitored for fidelity. It is important for a program like i-Ready that the teacher provides intervention when students are struggling with a certain skill. A student will be locked out of the skill and the teacher has to reset it. If this does not happen then the student will only be working on skills he/she mastered. For a program like Word Generation, it involves every major subject area do its part every week. If this is not done then the program loses its credibility. Since these programs were not closely monitored it is hard to tell if they were done correctly.

It is also important to note that most interventions are not meant to be given for one year. Interventions like i-Ready is meant to be three or more years in order to see student progress. It takes time for students and teachers to understand how to use the program, since it is online. A program like Word Generation has three series, meant to be taught over a three-year middle school span. This study showed one year of just i-

Ready and two years of i-Ready followed by Word Gen. This was not an adequate amount of time to be able to tell if either program was truly successful.

A recent research study (Federico (2017) explored student interaction to the i-Ready program. The study found that students had more negative experiences and off-task behaviors than positive experiences and on-task behaviors when using i-Ready. Therefore, a limitation to this study could include findings from Federico (2017) which included that positive experiences do not lead to on-task behaviors, i-Ready does not provide opportunities for student choice, and i-Ready does not support the development of 21st century skills.

The accessibility of computers has proven to be a major hindrance for schools and tertiary institutions offering computer-based learning programs. Computer literacy has also been found to have a significant influence on whether students feel equipped in attempting these computer-based learning programs. It has, however, been proven that the more students are motivated to learn, the more likely it is that they will be successful in their efforts. Some factors that play an important role in student motivation are teacher motivation and skills, parental involvement, and the effective use of technology. Technology provides opportunities for teachers to meet the needs of students with various learning styles through the use of multiple media (Bryant & Hunton, 2000). It is therefore imperative that schools ensure that teachers and educators have enough knowledge of computer systems and also show proficiency in computer-based training and the operation and application thereof, in order to ensure the success of programs such as this research tested. Teachers cannot successfully

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implement training interventions that are technology based without being familiar and comfortable with the technology and media utilized for its application.

While the researcher conducted this study by utilizing a sample of approximately 1300 students, the sample included all three student groups (GenEd, SWD, and ELL students). There are many factors at play on students during their years at school which could have an effect on their day to day academic performance and this needs to be factored in future quantitative analyses using multi-level, multivariate models and multiple regression analysis. Accordingly, the results of this research are preliminary.

Recommendations

Using i-Ready Diagnostic data from over four million students who took the program in the 2016–2017 academic year, The Curriculum Associates observed that students using i-Ready Instruction experienced slightly larger learning gains than students who used WordGen. The Curriculum Associates, LLC (2004) initiated a program with a Public School in NY with a diverse student population extending to special needs students, and a large ELL population. The118% increase in students on or above grade level in reading proved the success that can be attained with the i-Ready program in an underprivileged school.

In a study which was concluded on the effects of the Word Gen intervention program on student learning, the findings were significant, however, still small (Lawrence et al., 2017). On average, students in GenEd schools improved on the test of Word Gen vocabulary, while students in SWD schools showed slightly higher levels of improvement. Based on these results, this model suggests that although all students

and schools participating in the Word Gen program improve on vocabulary, there is a discrepancy across students with a stronger cascading effects on low-baseline students' general vocabulary skills (Lawrence et al., 2017).

Based on these past studies and my current study, I believe student level data should be used to understand how these interventions affect student test scores. Students, from different subgroups, should be randomly divided into two cohorts and each given a different intervention, either i-Ready or Word Gen over a course of three years. The fidelity of each intervention should be monitored and each student can be tracked over the three-year span.

Implications

Further research and exploration are required to establish and improve the comprehension of the needs of each student, and the type of intervention that works best for them. With the vast number of interventions available, it is nearly impossible to match every student to the perfect best suited intervention. The students that are far below the required literacy level such as SWD and ELL students, will not necessarily get the basic assistance if they are not tested according to their needs and allocated an intervention relevant to their specific level of understanding and required needs. Without the correct equipment, systems, and funding, it is close to unattainable to meet the needs of every single student.

Literacy instruction must have multiple entry points and content that is accessible and of interest to students from varied backgrounds and learning styles (Dodge & Ortlieb, 2016). There needs to be a connection between the specific teaching

strategy and the specific student's level of existing knowledge, experiences, and interests. Teachers can offer ideal literacy education for SWD and ELL students by considering multiple interventions that are focused on the requirements. It is important to note that no two interventions are similar and hold their own benefits and shortcomings, which needs to be taken into consideration by educators and teachers before resorting to the implementation of a specific intervention. All aspects of the varying interventions need to be weighed and studied, with the realization that that implementation of an intervention is preferential than no intervention at all.

Conclusion

The results of the study above and the findings of the researcher should be used with caution by teachers, educators, and parents when it comes to the effectiveness of both interventions, i-Ready and Word Gen. When each intervention was used for only a year, there was no significant improvement in ELA test scores. Also, when used one year each respectively, there was also no significant improvement in test scores.

This can show that interventions should be chosen carefully to meet the needs of the students. Using only one year of i-Ready and then switching to Word Gen was not successful in this study. It takes time for students to become acclimated to a program and really reap the benefits. By continuously switching programs, students will not get the full benefits, especially ELL and SWD. Both interventions were intended to be used by the same students over at least a three-year span. The results should also be of importance to districts, principals, teachers, and parents in NYC schools, and provide a better understanding of how interventions should be used to build the skills students

are missing, and not just to say students are receiving interventions. If the interventions

being given are not intentional then students can actually regress and schools will be

wasting time, money and resources. Ultimately, this study supports the findings that

there is no one size fits all approach when it comes to interventions.

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