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Lessons Learned: Effective Reading Practices For The Struggling Reader

Dr. Maria M. Salaiz

University of Texas Rio Grande Valley
Office of Educator Preparation & Accountability
1201 West University Drive
Edinburg, Texas 78539
E-mail: maria.salaiz@utrgv.edu
956-665-3437
956-665-2927 (fax)

Dr. Marie Simonsson

Department of Organization & School Leadership
University of Texas Rio Grande Valley
1201 West University Drive
Edinburg, Texas 78539
E-mail: marie.simonsson@utrgv.edu
956-665-7388
956-665-2927 (fax)

Dr. Velma D. Menchaca

Department of Organization & School Leadership
University of Texas Rio Grande Valley
1201 West University Drive
Edinburg, Texas 78539
E-mail: velma.menchaca@utrgv.edu
956-665-3479
956-665-2927 (fax)

Abstract

This study investigated schools who received Reading First (RF) monies to determine if student reading achievement in kindergarten through second grade was a function of the funding earmarked for implementation of the RF practices. The researchers also examined a seven-year reading progress trend to observe changes in Texas Primary Reading Inventory (TPRI) composite means of 37 participating campuses by grade level and by assessment measure from 2006 to 2012. Multiple linear regression and one-way repeated measures outputs were used for evaluating the evidence. A longitudinal progress trend was used over a seven-year period. Both a linear regression and a repeated measure analyses of variance produced significant results that supported the claim that the size of a reading budget had an impact on students' reading achievement. The linear regression judged the size of budget statistically significant at the .01 alpha level. The repeated measure analyses found differences and significant results among the means of the five TPRI measurements tested in kindergarten through second grade. The five critical elements of reading measured by TPRI included: phonemic awareness, graphophonemics, listening comprehension, accuracy, and reading comprehension. The analyses showed that student achievement was at its highest during the implementation of the RF program years. The analyses also showed a steady decline in reading composite scores after the loss of the funding. The results of the long trend performance examination might infer that the practices that teachers used in kindergarten through second-grade during the RF years were more effective than those used before or thereafter.

Key Words: phonics, fluency, reading comprehension, vocabulary, funding

Introduction

The United States has been responding to the challenges of improving reading education throughout history, from the colonial era to modern period. Learning to read in this country evolved from a simple goal of acquiring enough reading skills for the purpose of reading the Bible in the 1600's (Pulliam & Van Patten, 2007) to a demanding goal of learning to read proficiently in the present day to compete successfully in the global market economy (National Commission on Excellence in Education [NCEE], 1983). Throughout history, contributors of educational development passed legislation that changed the course of the American educational system. Significant events such as space wars and social issues over the last six decades intensified the concern for literacy prompting the government to initiate educational reform efforts to improve the quality of the nation's school system through legislation (National Defense Act, 1958; Elementary and Secondary Education Act, 1965; Goals 2000: Educate America Act, 2000; No Child Left Behind Act [NCLB], 2001; USDE Race to the Top, 2009).

An example of a government initiated educational reform effort to improve the quality of the nation's education through legislation was the No Child Left Behind Act (NCLB, 2001) and the Reading First (RF) program (U.S. Department of Education, 2002). Reading First was designed to help struggling readers in kindergarten through third grade. Although the RF program came and went, the lessons learned are part of the state's English Language Arts curriculum (Texas Education Agency, TEKS, 2022).

Statement of the Problem

The RF program provided approximately \$6 billion in grants to help struggling students improve reading achievement over a six-year period (U.S. Department of Education, 2008b). Gamse et al. (2008, as cited by U.S. Department of Education, 2002) reported that the earliest RF grants were awarded between July 2002 and September 2003. The authors reported that 5,880 of the nation's schools had participated in the RF program by April 2007. School districts and campuses with high rates of poverty and reading failure had the highest funding priority. The program funded practices such as, professional development for educators on effective instructional methods for teaching reading, curricular materials, valid and reliable screening, diagnostic assessments, ongoing classroom assessments, and statewide accountability to leadership structures from fiscal years 2003 to 2008 (Reading First [RF], 2008).

Congress decreased the appropriation for Reading First by 61% in Fiscal Year 2008 (USDE FY Budget 2009 Summary, 2008a). Proponents of the program, like former Secretary Margaret Spelling, publicly supported the plan in hopes that Congress would restore Reading First funds to its Fiscal Year 2007 level of \$1 billion. Spelling (USDE, 2008c) feared that the budget reduction would force schools to abandon the strategies that worked well with struggling readers. Spelling wrote, "Reading First has done so much to crack the code on how to get kids to read. It would be tragic to cut the nation's only reading program when so many policymakers and teachers know it's working to increase achievement" (p.1). Despite the efforts, Congress eliminated the program funding in fiscal year 2009.

Significance of the Study

This research was important because it contributed to the existing, applied, and basic body of knowledge of what is known about reading instruction. The research addressed a real-world problem. Chhabra and McCardle (2004) noted, Dr. G. Reid Lyon found evidence-based practices that transformed reading education. Findings from twenty years of "rigorous methodologies for the study of the development of reading and the effectiveness of instructional approaches and for the testing of reading" (p. 5) led Dr. Lyon and the National Reading Panel (NICHD, 2000) to determine that "systematic instruction in the components of reading-phonemic awareness, phonics, fluency, vocabulary, and comprehension was effective in teaching children to read" (p. 7).

Chhabra and McCardle (2004) also noted that scientific research from multiple interagency partnerships led by the NICHD indicated that the ability to read was necessary for children's success. How well the children read and understand may have implications on their future academic, career, and personal opportunities. Chhabra and McCardle (2004) further stated that children's inability to read may affect their emotional health, economic security, and public health as well. These findings contributed to the importance of the study.

Also, this study might have significance for political leaders and educators. The government invested billions of dollars on implementing research-based reading instruction to help children learn to read. It might be of interest to policymakers such as Board of Trustees, Superintendents, Principals, or political leaders to learn which program elements of the Reading First program were believed to be sustainable by educational leaders. The findings could provide educational leaders a better understanding of the key practices that are essential for reading success; thus, informed decisions on the budget and appropriate allocation of funds to support research-based reading programs could be made. It might be key that school administrators and teachers use this information to determine if the research based instructional practices identified by the National Reading Panel (NICHD, 2000) are effective enough for continuing implementation in their schools without the funding.

Purpose of the Study

The National Reading Panel (NICHD, 2000) reported an analysis review to the House Committee on Education and the Workforce, Subcommittee on Education Reform. The panel's analysis determined that systematic instruction in the components of reading was effective in teaching children to read. The five components of reading proven to be scientifically based were phonemic awareness, phonics, fluency, vocabulary, and comprehension (NICHD,2000; Chaabra & McCardle, 2004).

The purpose of this study was two-fold. First the researchers investigated Reading First schools in the Rio Grande Valley to determine if student reading achievement in grades Kindergarten through second grade was a function of funding. Second, the researchers investigated if the variance in the population means of the five scientific based components of reading (phonemic awareness, phonics, fluency, vocabulary, and comprehension) were significant as measured by the Texas Primary Reading Inventory (TPRI) assessment.

Research Questions

The following questions guided the study: 1) Is student reading achievement in kindergarten through second grade accounted for by funding and/or campus size in 37 campuses? 2) Do population means on phonemic awareness, graphophonemics, listening comprehension, accuracy and/or reading comprehension measurements vary between and among years with the kindergarten through second grade groups?

Review of Literature

The review of literature was designed to assist educational leaders understand the impact that explicit and systematic reading instruction has had on marginalized children. The literature has been based on research from a multitude of references and is sequenced in the following order: theoretical frameworks, contextual information, and test results from national, state, and local educational agencies. This literature might help school leaders decide if the reading practices as outlined in this review might be effective enough to sustain them in their schools without the government funding.

Theoretical Framework

Theoretical frameworks from John Dewey (1916) and Dan Lorti's (1975) theories on education guided this study. John Dewey was instrumental in reforming education in the 20th century. He was a proponent of hands-on learning or experiential education (Dewey, 1916/2009). Dan Lorti (1975) believed that continuous professional development throughout the teacher's tenure was important to the future of the students. He found that novice teachers learned from their own alumnus educational experiences and tended to revert to the old-age school teaching approach in their own classrooms. This study borrowed from the theorists' philosophical ideas on education reform.

Dewey advocated for a balance between delivering knowledge while considering the interests and experiences of students. He postulated that experience was at the core of learning, where experiences were reorganized and reconstructed (Dewey, 1916). He believed that children's experiences were formed by their social constructs. He advocated the removal of a teacher-centered curriculum where teachers would disseminate information to students, thus creating passive learners. He believed students were stifled with this approach (Dewey, 1904). Dewey advocated for a student-centered curriculum where students would take control of their learning by connecting knowledge with prior experiences. Thus, students would create a deepened relationship and connection with the newly acquired knowledge.

He believed it was important for teachers to organize their content prior to delivering the lesson; therefore, taking students' prior experiences, knowledge, and readiness into account when teaching. Thus, teachers would act as facilitators of new knowledge.

Lortie (1975) advocated for teacher education. He described the phenomenon that teachers teach as they were taught; consequently, applying an old-school teaching approach on the profession. He described the occurrence where teacher candidates arrive in teacher preparation programs having spent thousands of hours observing their own teachers in action and learn to behave, imitate, and repeat their practice. He based his claim on the idea that the average student spends 13,000 hours in direct contact with classroom teachers by the time he/she graduates from high school. Lortie suggested that the apprenticeship of observation provides novice teachers with a powerful but limited, intuitive understanding of teaching. One of the consequences may be that novice teachers may fail to realize that the aspect of teaching that they observed was only a partial view of a teacher's job. For example, a novice teacher's partial behavioristic view might have been limited to monitoring, lecturing, and correcting; thus, overlooking other behaviors such as selecting goals, and planning. Lortie cautioned that this theory should not be underestimated because novice teachers will tend to revert to their old-school teaching default model if they are not educated properly or if they don't receive continuous professional development throughout the tenure. On the other hand, if novice teachers are trained to use high quality, scientifically based reading strategies like those provided by the RF program, their efforts would have a robust and positive impact on many children.

This study borrowed from the theoretical frameworks and the findings of the National Reading Panel (NICHD, 2000) in that content and teacher preparation have proven to be instrumental in effectively addressing the way that the marginalized youths in the country learn. This study showed that the relationship between the pedagogical reading practices and teacher professional development implemented during the early 2000s worked.

Contextual Evidence

The complexity of the reading dilemma in the United States can best be understood through early reading research studies. For example, Hart and Risley (1995) found that a language experience gap exists before children entered Kindergarten. The authors stated that children born to a professional family hear 2,153 words per hour, 215,000 words per week, 11 million words per year, and 45 million words in four years. Children born to a working-class family hear 1,251 words per hour, 125,000 words per week, 6 million per year, and 26 million in four years. Children born to a family in welfare hear 616 words per hour, 62,000 per week, 3 million per year, and 13 million in four years. Moats (2004) resonated academic achievement optimism for the children who entered our schools with a gap in vocabulary when she stated, "Fortunately, children who begin schooling at a disadvantage in letter, sound, word, and concept knowledge can be taught to read and write well if their teachers consistently implement a linguistically informed, structured, comprehensive, and content-rich curriculum" (p. 269).

The work of the National Research Council (NRC) on *Preventing Reading Difficulties in Young Children* (Snow et al., 1998) presented an overview of the research literature in reading, language development, and child development. The report emphasized the importance of (1) learning to read, (2) conditions necessary for reading success, (3) early intervention for struggling readers, and (4) ensuring high quality instruction for all children. The National Reading Council's report (Snow et al., 1998) became the basis of the federal definition of scientifically based reading research and became central to the *Reading Excellence Act of 1998* (Chhabra & McCardle, 2004).

Research from the National Institute for Literacy, Partnerships for Reading (2003) confirmed that too many of our nation's children continued to struggle with learning to read. The NIL (2003) stated that the reading failure had resulted in children lacking self-confidence, lacking motivation to learn, and suffering from inadequate academic performance aftereffects in later school years.

The National Reading Panel (NICHD, 2000) conducted their own research and reported their findings in their own report, *The Report of the National Reading Panel, Teaching Children to Read: An Evidence-Based Assessment on the Scientific Research Literature on Reading and its Implications on Reading Instruction: Report of the Subgroups* (NICHD, 2000). They found that systematic and explicit instruction in phonemic awareness, phonics, guided oral reading, vocabulary, and comprehension helped children develop their reading and spelling skills. The NRP (NICHD, 2000) also found that teacher preparation was an important component noted to be effective in the reading program.

Ensuring that teachers had the skills needed to teach the program effectively plus teaching teachers to screen and identify students’ reading barriers were critical parts of the program as well.

Collectively, these findings guided the development of public policy on literacy instruction (Sweet, 2004), a reading program better known as the “academic cornerstone” (USDE, 2008c, p. 1) of the No Child Left Behind Act (2001). The reading components found to be most important are summarized below: phonemic awareness, phonics, guided oral reading, vocabulary, and comprehension (USDE, 2008c).

NAEP Assessment Results

The government has used NAEP assessment results to communicate with the public about the academic achievement of the elementary and secondary students in the United States (National Center for Education Statistics [NCES], 2007) for almost four decades in reading, mathematics, science, writing, and other subjects. For this study, the NAEP longitudinal report for students in grades four and eight in Reading was used to illustrate results.

Deshler (2010) used the data reported in the Nation’s Report Card (Lee et al., 2007) to conclude that the American educational system had been successful in raising the reading scores of younger children. In a written testimony to the Senate Committee on Health, Education, Labor, and Pensions reported alarming statistics from published reports. Deshler borrowed from the Nation’s Report Card (Lee et al., 2007) who reported that 6 million of America’s middle and high school students were struggling readers; less than one-third of middle and high school students had the literacy skills they needed to succeed in school or beyond; and 70% of middle school and high school students read below proficiency. He borrowed from Gewertz (2009) who found that three out of every ten high school students and nearly 50% of students of color did not graduate on time. Other sources included the National Governors Association (2005) who reported that 40% of high school graduates lacked the literacy skills employers sought, while Greene (2000) found that young adults’ lack of basic skills cost the United States’ universities and businesses as much as \$16 billion annually. Deshler summarized the findings by saying, “Collectively, these findings resoundingly underscore the fact that insufficient literacy attainment negatively impacts students’ opportunities for success in the classroom, leading to higher likelihood of dropping out of school, as well as markedly reducing earnings as adults” (2010, p. 2). He concluded that the American educational system had been successful in raising the reading scores of younger children.

According to the Nation’s Report Card (Lee et al., 2007), significant gains for fourth graders since 2002 were reported. The average reading score was 2 points higher since 2005 and 4 points higher compared to the first assessment in 1992. The report concluded that higher percentages of fourth grade students were performing at or above the *Basic* and *Proficient* levels in 2007 than ever before. Deshler (2010) credited the federal investment in Reading First for the success. Deshler said, “These achievement gains ... demonstrate that targeted federal investments that require schools to use evidence-based methods can produce significant growth in student performance” (2010, p. 3).

Tracking students by cohorts might help the readers interpret the results more effectively; thus, follow Deshler’s logic more closely. The Nation’s Report Card (NCES, 2019) depicted in Figure 1 illustrates a performance trend for students in fourth and eighth grade. The sample population includes both non-RF students and RF students.

Figure 1 Fourth and Eighth NAEP Reading Scores



- ◆Denotes 4th grade scale scores
- Denotes 8th grade scale scores
- *Denotes RF Cohorts tested in 4th Grade only
- **Denotes RF Cohorts tested in both 4th and 8th Grade
- ***Denotes RF Cohorts tested in 8th Grade Only

Figure 1 depicts students belonging to one of five groups: 1) Before RF Kindergarten Cohort, 2) RF Kindergarten Cohort 2003, 3) RF Kindergarten Cohort 2005, 4) RF Kindergarten Cohort 2007, and 5) After-RF Kindergarten Cohort 2009 and Thereafter. Two before-RF cohorts were tested in years 2003 and 2005, four during-RF cohorts were tested in years 2007 through 2015 and two after-RF cohorts were tested in 2017 and thereafter.

Before RF Kindergarten Cohort. The Before RF Kindergarten Cohort were in kindergarten in 1999, in fourth grade in 2003, and in eighth grade in 2007. This group did not receive special funding to improve their reading. For this study, results from school year 2003 were used as a point of reference from which future measurements were compared to determine progress or lack of progress. The average reading scale score in fourth grade Reading in 2003 was 218. The average reading scale score in eighth grade Reading in 2003 was 263.

RF Kindergarten Cohort 2003. Elementary children from school districts and campuses with high rates of poverty and reading failure who qualified for the funds and services in 2002-2003 were among the first group of students to be tested in 2007. It is important to note that not all nation's students who tested in 2007 received RF services. Figure 1 shows that students who were in kindergarten in 2003 tested twice with a mix sample of RF and Non-RF students: the first time in fourth grade Reading in 2007, and the second time in eighth grade Reading in 2011. The nation's sample included both students who had received instruction using the RF strategies and students who had not received RF instruction.

According to NCES (2007), approximately 175,000 of our nation's fourth grade students participated in the Reading assessment. The average reading scale score in the 2007 assessment for fourth grade Reading was (221), 3 points higher than the Before RF cohort in 2003 (218). The NCES (2011) reported that approximately 168,200 eighth graders participated in the National assessment in Reading. The average reading scale score in the 2011 assessment for eighth grade Reading was (265), two points higher than the scale score in 2003 (263). Congress used the NCES (2007) results as one of the sources to evaluate the RF program. Figure 1 shows that at the time that Congress decided to eliminate the RF program in 2008, only the first 2003 RF cohort had tested.

RF Kindergarten Cohort 2005. Figure 1 shows that the RF Kindergarten Cohort 2005 tested twice in Reading with a mix sample of RF and Non-RF students: once in 2009 in fourth grade, and another time in 2013 in eighth grade. Over 178,000 fourth graders participated in the reading assessment. The average reading scale score in the NAEP (NCES, 2009) assessment for fourth grade was 3 points higher than the average scale score in 2003. There was no change from previous year. Approximately 170,100 eighth grade students tested. The average reading scale score in the NAEP (NCES, 2013) assessment for eighth grade Reading was 5 points higher than the scale score in year 2003 and 3 points higher than the previous year.

RF Kindergarten Cohort 2007. The RF Kindergarten cohort 2007 received partial funding. These students tested with a mix sample of RF and Non-RF students in grade four in 2011, and in grade eight in 2015. The average reading scale score in the NAEP (NCES, 2011) assessment for fourth grade Reading was 3 points higher than in 2003, but no change from the previous two assessments. This was the last group to participate in RF. Approximately 213,100 students tested. The average reading scale score in the NAEP (NCES, 2015) assessment for eight grade Reading was 2 point higher than the scale score in year 2003 and 2 points lower than the previous assessment. Approximately 136,500 eighth graders tested.

After-RF Kindergarten Cohort 2009 and Thereafter. The groups After-RF Kindergarten Cohort 2009 and Thereafter did not receive funding to improve their reading. As illustrated in Figure 1, these groups tested in 2017 and 2019. Approximately 294,000 fourth and eighth grade students participated in the 2019 reading assessment. Their average reading scale score in the NAEP (NCES, 2019) assessment for fourth grade Reading was three points lower than in 2015. The average reading scale score in 2019 for eighth grade Reading was two points lower than 2015.

Other Findings. Reports from state and local educational agencies showed a gain from the first year of implementation in 2003 to 2007. The state education agencies reported that Reading First students from nearly every grade and subgroup made impressive gains in reading proficiency (USDE, 2008c). Increases in the percentage of English language learners and students with disabilities proficient in reading comprehension were reported. In grade one, 28 out of 37 state education agencies reported increases in the percentage of ELL students; and 34 out of 44 state education agencies reported increases in the percentage of students with disabilities proficient in reading comprehension (USDE, 2008c). In grade two, 25 out of 37 state education agencies reported increases in the percentage of ELL students; and 30 out of 48 state education agencies reported increases in the percentage of students with disabilities proficient in reading comprehension (USDE, 2008c). In grade three, 17 out of 25 state education agencies reported increases in the percentage of ELL students; and 25 out of 32 state education agencies reported increases in the percentage of students with disabilities proficient in reading comprehension (USDE, 2008c).

The Reading First state profile (2007) reported a gain in the Texas schools from 2003 to 2007. Students in third grade showed a gain of 32.2%; second grade showed a gain of 17.1%; and first grade showed an increase of 12.0%. Texas reported that Reading First appeared to have a significant impact on Kindergarten English performance. The Total Reading scores for Texas Reading First schools were higher than the comparison schools in 2006-2007. The analysis found these gains to be in relation to higher phonological awareness and graphophonemic knowledge scores.

Race to the Top

While the RF program was being eliminated, a new program was being initiated. In 2009, the Obama Administration created a \$4.3 billion dollar grant competition for states, "Race to the Top." The emphasis shifted from reading to science, technology, engineering, and mathematics. States competed for big grants, and the money was distributed to states that adhered to the reform (USDE, 2009). Although the government has continued to provide funds to schools through Part A (Title I) of the Elementary and Secondary Education Act (ESEA, 1965), as amended by Every Student Succeeds Act, a reading federally funded program like RF has ceased to exist.

Method

The researchers used a multiple linear regression and repeated-measures analysis of variance procedures to evaluate the extent student achievement in Reading was accounted for by the size of funding and/or campus size in 37 campuses in south Texas. The researchers also examined a seven-year reading progress trend to observe changes in Texas Primary Reading Inventory (TPRI) composite means of the 37 participating campuses by grade level and by assessment measure from 2006 to 2012. This examination allowed the researchers to visually determine the student reading performance trend over a seven-year period.

The data collected were analyzed using exploratory multiple linear regression, F-distribution, and an alpha level of .05 to carry out the test of significance. Three regression indices were presented in the output for this procedure: the multiple regression coefficient (R), its squared value (R^2), and the adjusted R^2 . The researchers also analyzed the collected data using the one-way repeated-measures analysis ANOVA. The SPSS II version 19 (IBM Corp, 2010) for a one-way within subjects ANOVA produced numerous outputs: descriptive statistics, statistics for evaluating sphericity assumptions, ANOVA results using the multivariate tests, tests of within subject effects, and tests of between subject effects.

Participants

The 259 subjects in this study were purposively selected. The sampling strategy was based on an archived list of participating RF districts and campuses outlined in the Texas Education Agency Cycle 2, Year 1 Grant (2007a) program. The state awarded approximately \$39,000,000 of the RF Grant program to seventy-five Texas districts. Out of the seventy-five school districts that received grants, seven districts were from the Region One Education Service Center area in Texas. Out of the seven districts, five superintendents agreed to participate in the study.

Instrumentation

The instruments used to conduct the study included Texas Primary Reading Inventory (TPRI) assessment reports, grant and budget financial documents, and Academic Excellence Indicator System (AEIS) reports. A description of each instrument follows.

Texas Primary Reading Inventory (TPRI)™

According to University of Houston Health Science Center (2021), the TPRI instrument identified the reading development of students in kindergarten through second grade. Although the assessment was given three times a year, the—beginning, middle, and end of the year, only end of year data were collected. The instrument provided specific information about the students' strengths and weaknesses in phonemic awareness, graphophonemic, reading accuracy, listening comprehension, and reading comprehension. TPRI campus composite scores from 2006 through 2012 were collected.

Funding Documentation

The Business Offices rendered information on the RF grants awarded from 2004 to 2009. Two districts provided detailed summary expenditure reports and 3 districts reported the total awards per year on a word document. Although money was allocated to campuses in 2004 and 2005 school years, these amounts were excluded from the analysis because records of the TPRI scores were non-existent during this time period, according to the districts' curriculum staff. Without TPRI scores, the data set would be incomplete. For the non-funded years, the researchers strategically calculated an estimated amount of local monies allocated to campuses using a standardized formula.

Campus Size

The researchers pulled campus enrollment data from the Academic Excellence Indicator System (Texas Education Agency, 2007b, 2008, 2009, 2010, 2011, 2012, 2013, 2014) for the 37 campuses that participated. The researchers retrieved the enrollment class size data for kindergarten, first grade, and second grade from each of the 37 campuses.

Results

The results of the multiple linear regression, repeated-measures analysis of variance, and longitudinal study are illustrated in the subsequent tables and figures. This examination allowed the researchers to evaluate the extent student achievement in Reading may have been related to the size of funding and/or campus size in 37 campuses in south Texas. The seven-year longitudinal study allowed the researchers to visually determine the student reading performance trend over a seven-year period.

Multiple Linear Regression of Reading Achievement and Two Factors (funding, and campus size) in Kindergarten through Second Grade

The predictors for the first set of analyses were funding and campus size. The criterion was the TPRI index that measured the composite score on phonemic awareness, graphophonemics, listening comprehension, accuracy and comprehension (n=259). Table 1 depicts the results of the analysis. Relevant descriptive statistics included the mean for student achievement = 747.31, budget mean = \$67,139.90 and the campus size mean = 290 students.

Table 1. Multiple Linear Regression of Reading Achievement and Two Factors in Kindergarten-Second Grade

Grade K-2	Variables Include X	Variable Removed	R	R ²	Adjusted R ²	P
Y ₁ reading	X ₁ X ₂	None	.18	.03	.02	*.02
	X ₁ budget	X ₂	.17	.03	.03	*.01
	X ₂ campus size	X ₁	.06	.004	.000	.31

* $p < .05$

The regression equation evaluated two predictors: budget and campus size. The budget index contributed significantly to Kindergarten through second grade student reading achievement, $R = .171$, $R^2 = .03$, adjusted $R^2 = .03$ with an $F(1, 257) = 7.721$, $p < .05$. Campus size in Kindergarten through second grade did not contribute significantly to student reading achievement, $R = .06$, $R^2 = .004$, adjusted $R = .000$, with an $F(1, 257) = 1.043$, $p > .05$.

The findings supported two conclusions. First, it can be concluded that student reading achievement in kindergarten through second grade data set was related to funding. Thus, an increase in reading achievement in grades Kindergarten through second grade can be explained by the increase in the budget. Second, it can also be concluded that student reading achievement in kindergarten through second grade was not related to campus size.

Repeated-Measures ANOVA of Kindergarten-Second Grade Reading Performance

The Repeated-Measure Analysis of Variance examined a seven-year longitudinal reading progress trend to observe changes in TPRI composite means of the 37 participating campuses by grade level and by measure from 2006 to 2012. Five one-way repeated-measures analyses conducted for the kindergarten through second grade group compared the 2006 TPRI assessment scores to 2009 and compared 2009 TPRI scores to 2012. TPRI data were not available prior to 2006; the year 2006 was the first year of record that schools reported the TPRI assessment as a measurement of students' reading progress for the RF program. The year 2008-2009 was the year that Congress reduced the funding by 60%. The year 2009-2010 was the last year of the RF program for these campuses, and 2012 was the year data were collected for the study.

Five within subjects ANOVA were conducted for each of the TPRI measurements to evaluate whether means on the TPRI were significantly different over time. The results of the Wilk's Lambda, Mauchly's Test of Sphericity, and Greenhouse-Geisser with conservative degrees of freedom tests were used with the F -distribution to test the null hypotheses.

Repeated-Measures Analysis of Variance of Phonemic Awareness in Kindergarten and First Grade.

The first analysis evaluated the means on the phonemic awareness measurement in the kindergarten and first grade group among years. The results of the multivariate test of the Wilks' Lambda showed a derived value, $\Lambda = .620$, $F(6, 31) = 3.169$, $p < .05$. Sphericity could not be assumed with the Mauchly's values; $\underline{W} = .244$; $p < .001$; therefore, the Greenhouse-Geisser conservative degrees of freedom were used with the F -distribution to test the null hypothesis. The one-way repeated-measure ANOVA showed significant time effect with the Phonemic Awareness composite scores at the .01 alpha level (Table 2). The multivariate $\eta^2 = .38$. This means that 38% of the variance in the total data set could be explained by the differences among years.

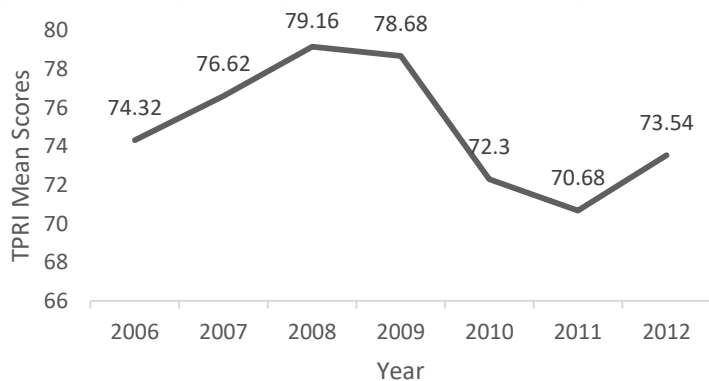
Table 2 One-Way Repeated-Measures Analysis of Variance of Phonemic Awareness in Kindergarten and First Grade

Sources of Variations	Sums of Squares	df usual	df conservative	MS	F
Between Subjects	10,807.96	36			
Within Subjects	21,890.57	155.14			
Between Years	2,295.56	4.19	1	547.41	**4.217
"Error" term	19,595.01	150.95	36	129.81	
Total	32,698.53	191.14			

* $p < .05$; ** $p < .01$

Figure 2 illustrates the seven-year trend of student performance in phonemic awareness in kindergarten and first grade. The standard deviations ranged from 8.32 to 13.38. It indicates that the variances were different from each other. Figure 2 illustrates that students performed best in 2008 and 2009.

Figure 2 Means of Kindergarten-Second Grade Performance in Phonemic Awareness



The next analysis evaluated the means on the graphophonemic measurement of the kindergarten through second grade group among years. The results of the multivariate test of the Wilks' Lambda showed a derived value, $\Lambda = .416$, $F(6, 31) = 7.247$, $p < .01$. Sphericity could not be assumed; Mauchly's derived value, $W = .280$; $p < .00$. The results of the Greenhouse-Geisser analysis showed significant time effect with the graphophonemic means at the .01 alpha level. The one-way repeated-measure ANOVA showed significant time effect with the Graphophonemics composite scores at the .01 alpha level (Table 3). The multivariate $\eta^2 = .58$. This means that 58% of the variance in the total data set could be explained by the differences among years.

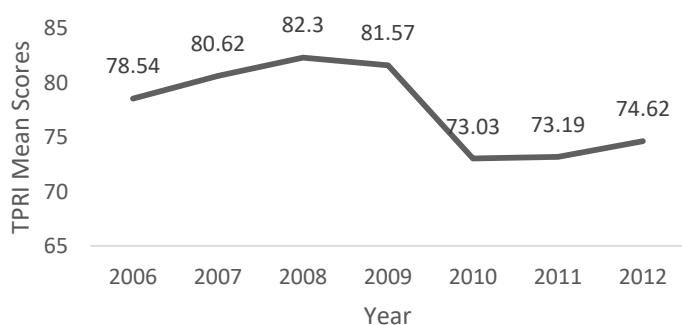
Table 3 One-Way Repeated-Measures Analysis of Variance of Graphophonemics in Kindergarten-Second Grade

Sources of Variations	Sums of Squares	df usual	df conservative	MS	F
Between Subjects	8,572.62	36			
Within Subjects	15,874.29	152.52			
Between Years	3,588.85	4.12	1	870.63	**10.516
"Error" term	12,285.44	148.40	36	82.79	
Total	24,446.91	188.52			

* $p < .05$; ** $p < .01$

Figure 3 illustrates the seven-year trend of the graphophonemic (vocabulary) measurement in the collective grades Kindergarten through second. The standard deviations ranged from 6.95 to 11.29. The best scores were noted in 2008 and 2009.

Figure 3 Means of Kindergarten-Second Grade Performance in Graphophonemics



One-Way Repeated-Measures Analysis of Variance of Listening Comprehension in Kindergarten.

The third analysis evaluated the means on the listening comprehension measurement of the kindergarten group among years. The assessment was administered to kindergarten students only. The results of the multivariate test of the Wilks’ Lambda showed a derived value, $\Lambda = .37$, $F(6, 31) = 8.907$, $p < .01$. These results showed significant time effect with the listening comprehension scores at the .01 alpha level. Sphericity could not be assumed; the Mauchly’s derived value, $\underline{W} = .260$; $p < .01$. The Greenhouse-Geisser conservative degrees of freedom showed significant time effect with the listening comprehension measurement. The one-way repeated-measure ANOVA showed significant time effect with the Listening Comprehension composite scores at the .01 alpha level (Table 4). The multivariate $\eta^2 = .17$. This means that 17% of the variance in the total data set could be explained by the differences among years.

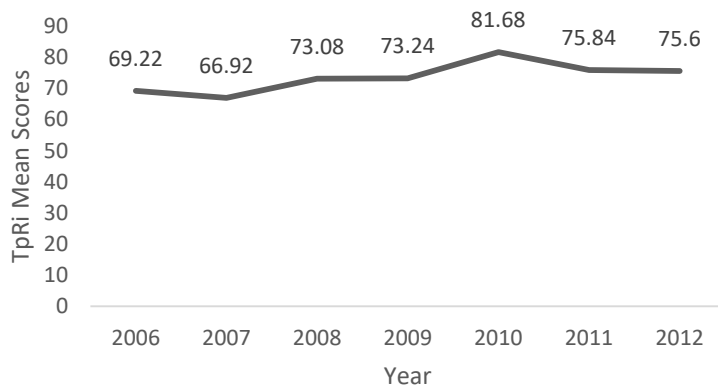
Table 4 One-Way Repeated-Measures Analysis of Variance of Listening Comprehension in Kindergarten-Second Grade

Sources of Variations	Sums of Squares	df usual	df conservative	MS	F
Between Subjects	35,849.01	36			
Within Subjects	30,579.72	154.91			
Between Years	5,122.08	4.19	1	1223.42	**7.243
"Error" term	25,457.64	150.72	36	168.91	
Total	66,428.73	190.91			

* $p < .05$; ** $p < .01$

The results in Figure 4 illustrate a consistent gain from 2006. The standard deviations ranged from 9.61 to 19.37, indicating that the variances were different from each other. The highest score was noted in 2010.

Figure 4 Means of Kindergarten Performance in Listening Comprehension



One-Way Repeated-Measures Analysis of Variance of Accuracy in First and Second Grade.

The third analysis evaluated the means on the accuracy (fluency) measurement of the first and second grade groups among years. The results of the analyses produced conflicting results. First the multivariate test of the Wilks’ Lambda showed a derived value, $\Lambda = .705$, $F(6, 31) = 2.158$, $p > .05$. These results did not show significant time effect with the accuracy scores at the .05 alpha level. The Mauchly’s derived value, $\underline{W} = .259$; $p < .01$; sphericity could not be assumed. The Greenhouse-Geisser and the Huyn-Feldt tests indicated significance at the .05 level; however, the Lowerbound conservative degrees of freedom did not. The one-way repeated-measure ANOVA showed significant time effect with the Accuracy composite scores at the .05 alpha level (Table 5). The multivariate $\eta^2 = .07$. This means that 7% of the variance in the total data set could be explained by the differences among years.

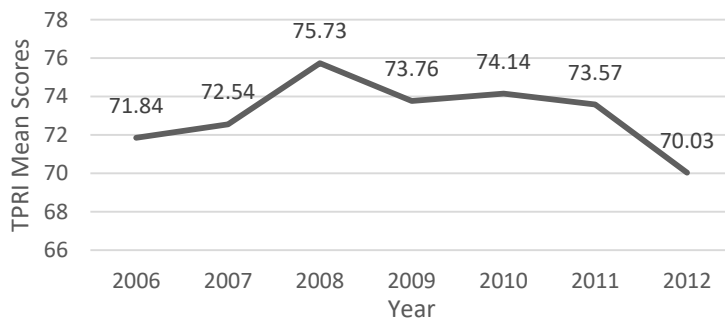
Table 5 One-Way Repeated-Measures Analysis of Variance of Accuracy in First- Second Grade

Sources of Variations	Sums of Squares	df usual	df conservative	MS	F
Between Subjects	5,026.13	36			
Within Subjects	11,232.00	157.32			
Between Years	739.43	4.25	1	173.91	*2.537
"Error" term	10,492.57	153.07	36	68.55	
Total	16,258.13	193.32			

* $p < .05$

Figure 5 indicates that the largest variance occurred between 2008 and 2012. The standard deviations range from 6.97 to 8.88. It can be determined that because the multivariate Wilks' Lambda, the lower bound conservative degrees of freedom and the pairwise comparison analyses rendered not significant outputs, the analyses failed to reject the null hypothesis.

Figure 5. Means of First and Second Grade Performance in Accuracy



One-Way Repeated-Measures Analysis of Variance of Reading Comprehension in First and Second Grade.

The final analysis evaluated the means on the reading comprehension measurement of the first and second grade group among years. The results of the multivariate test of the Wilks' Lambda showed a derived value, $\Lambda = .517$, $F(6, 31) = 4.820$, $p < .01$. These results showed significant time effect with the Reading Comprehension means at the .05 alpha level. Sphericity could not be assumed; the Mauchly's derived value, $W = .196$; $p < .01$. The Greenhouse-Geisser conservative degrees of freedom indicated time effect significance at the .01 level. The one-way repeated-measure ANOVA showed significant time effect with the Reading Comprehension composite scores at the .01 alpha level (Table 6). The multivariate $\eta^2 = .48$. This means that 48% of the variance in the means of the Reading Comprehension achievement with the first and second grade students can be accounted for or explained by the differences among years.

Table 6 One-Way Repeated-Measures Analysis of Variance of Reading Comprehension in First and Second Grade

Sources of Variations	Sums of Squares	df usual	df conservative	MS	F
Between Subjects	12,497.53	36			
Within Subjects	19,953.42	139.64			
Between Years	2011.71	3.77	1	533.01	**4.036
"Error" term	17,941.71	135.87	36	132.05	
Total	32,450.95	175.64			

* $p < .05$; ** $p < .01$

Figure 6 illustrates the seven-year student performance trend in reading comprehension. The standard deviations ranged from 7.09 to 15.24. The graph indicates that the variances are slightly different from each other. The trend shows that students' performance in reading comprehension began to gradually decline in 2009 and continued to decline in the years that followed.

Figure 6 Means of First and Second Grade Performance in Reading Comprehension



Discussion

The summary of the findings indicated that differences among the means of four TPRI measurements tested in kindergarten through second grade were significant and one was questionable. There was a difference among the means for the measurements in phonemic awareness in grades Kindergarten and first grade, graphophonemic in all three grades, listening comprehension in kindergarten, and reading comprehension in first and second grade groups across the years. The difference among the means for the accuracy measurement in first and second grade could not be determined. As previously mentioned, some of the multivariate test produced significant results on the accuracy measurement while other tests did not.

The multiple linear regression and the one-way repeated-measures Analyses of Variance on the TPRI assessments showed that students performed best during the RF years than the non-RF years in four out of five measurements. Although the study determined that budget was related to student reading achievement, it is not clear which of the initiatives contributed most significantly.

Second, it can also be concluded that student reading achievement in kindergarten through second grade was not related to campus size. A closer look at the campus size in the kindergarten through second grade participant groups in this study showed a large disparity in campus size among the participants. Some campuses in the study had only 150 students in the kindergarten through second grade group while others had 502 students. In spite of the disparity in campus size, all RF campuses were allocated funding in proportion to their size or number of students served. Teachers from small or large campuses received equal opportunities to utilize the allocated monies as outlined by the RF program. Therefore, it was logical to conclude that campus size could not have been a factor that related to student learning in these campuses.

Conclusion

The results of long trend performance examination might infer that the practices that teachers were using in kindergarten through second grade during RF years were more effective than those used before or thereafter. The significance of this study is that reading performance was examined using a sample of students exposed to systematic and explicit RF interventions. The evaluations of the long-trend data from 2006 to 2012 indicate positive relationships between reading performance and funding during the RF funded years, i.e., as funding increased so did reading performance and as funding decreased so did reading performance. It is important to note that the sample of students tested and reported on the NCES (2007, 2009, 2011, 2013, 2015, 2019) studies included randomly selected students who may or may not have been exposed to various RF interventions. Campus size was not related to reading performance.

It might be concluded that the RF pedagogical methods were aligned to John Dewey's constructivist theory. His pedagogical issues and connections that he made between education and the child's experiences were brought to life in the RF classroom.

His educational approach and his ideas on humanism and equity were rekindled and experienced by the RF participants. It might also be concluded that educators can hope that the RF professional development training that the 100,000 teachers received was a life-long learning experience. Preparing teachers to effectively address the needs of the marginalized youths is instrumental to the future of the students. The Apprenticeship of Observation model's behavioristic learning, imitation and repeated practice features rendered beneficial to the novice teachers who were mentored by one of the 100,000 trained teachers during the RF era.

Recommendations for Practice and Further Studies

This study has implications for school and political leaders. It is of interest to policymakers such as board trustees, superintendents, and principals to identify the specific program elements that were effective during the RF period. The findings provide educational leaders a better understanding of the key practices that are essential for reading success; thus, informed decisions on the budget and appropriate allocation of funds to support research-based reading programs could be made. School administrators and teachers could use this information to determine if the research based instructional practices used during the implementation of the RF program were effective enough for reinstating in their schools today.

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