

Effect of Specialized In-Service Professional Development Activities on Elementary School Students' Reading Achievement

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ABSTRACT

The purpose of this study was to examine whether there was a significant increase in the reading achievement during second- and third-grade of the 12 students who attended Midway Elementary Professional Development School (PDS) from kindergarten through fifth grade. Additionally, the study was seeking a possible relationship between the in-service professional development required by the PDS and the reading achievement of the students as measured on the Developmental Reading Assessment (DRA) test. DRA scores were collected for the 12 students during their second (2003-04) and third grade (2004-05) school years. For each school year the pretest was conducted in the beginning of the fall semester, whereas the post-test by the end of the spring semester. Results indicated that on the average, students scored higher on the post-test than on the pretest. The limitations of our study and the concerns for the future studies are also discussed.

National accountability standards mandated by the *No Child Left Behind* (NCLB) Act of 2001 altered the scale used to measure public schools' success. In order to comply with NCLB, public schools must implement research-driven instructional practices to ensure students receive equitable opportunities for success in all content areas, including reading and literacy, and to participate in annual statewide testing. In an effort to improve student achievement and align

with NCLB, local universities and public pre-K–12 schools form collaborative partnerships that follow the professional development schools (PDS) model developed by the Holmes Group (1986). The working relationship emphasizes on-going, specialized professional development for inservice teachers to learn innovational instructional techniques and methodology (Klingner, Ahwee, van Garderen, & Hernandez, 2004; NCATE, 2001).

The proliferation of PDS school models continues to rise throughout the nation (AACTE, 2004; Levine, 2002), but much of the past literature largely focused on the effectiveness of pre-service teacher education training and outcomes (Teitel, 2001). Recent studies have begun to examine how professional development schools affected student achievement and reported results with varying degrees of success (Petrosko & Munoz, 2002; Ross, Brownell, Sindelar, & Vandiver, 1999; Trachtman, 2007).

Klingner, Ahwee, van Garderen, and Hernandez (2004) reported the findings that suggested students attending a PDS elementary school outperformed students in the same district attending non-PDS schools. Pine (2000) conducted a longitudinal study that compared the test scores of low-income minority students in a Michigan professional development school partnership with statewide test scores and the scores of one of the state's more affluent districts. Over an eight-year period, researchers found that the professional development school students' test scores in math, science, and reading met or exceeded state averages and the averages of the more affluent district. Early studies of the effect of PDS on student outcomes provided data that documented gains in student test scores, though they did not provide information about what types of changes in teaching and learning took place (Teitel, 1996).

Professional development within a PDS school is vital to the model's success (Cooner & Tocherman, 2004; NCATE, 2001), but in order for the model to grow from theory into practical application, the participants must enthusiastically enter into a structured, collaborative learning community, since collaboration is central to the PDS model (Teitel, 2003).

Buchanan, Bleicher, Behshid, Evans, and Ngarupe (2007) examined how teachers worked to meet their needs in a PDS setting by finding their voice. The study followed an interpretive design model that analyzed actions from the participant's point of view. Participants included 25 teachers at George Washington School (GWS), a public K-5 charter school. Results indicated that teachers working in the PDS valued the learning community embedded within the school. Another key element of the success at GSW came from classroom visits that include visiting peer classrooms, pre-service teachers entering the classrooms as interns, and visits from other outside members, such as professors, parents, and members of the community. This open door policy reflected the schools' belief that professional development is on-going and occurs every day.

GWS's stated success includes non-traditional forms of professional development, including peer observation and professor visits. Teachers become more confident and effective when the idea that teaching is learning is embraced and teachers' learning needs become contextualized to orient continuous learning in practice (Levine & Trachtman, 1997).

Inservice teachers need access to on-going opportunities to increase their skills so they can connect with new pedagogies (Darling-Hammond, 1996). Klingner, Ahwee, van Garderen, and Hernandez (2004) reported that teachers and administrators at Carter Elementary purport that the collaboration between the partnering school and inservice teachers directly affected student achievement. Teachers felt motivation to deliver better lessons after learning different strategies taught during in-class demonstrations. The direct feedback and consistent modeling of best

practices gave teachers the necessary tools to design instruction to meet student and district needs.

Intense professional development, as illustrated by the study conducted in George Washington School by Buchanan et al. (2007), can build thriving learning communities that foster instructional growth. Teachers at Carter Elementary were equally enthusiastic about their school's relationship in the PDS model, but Klingner et al. (2004) cautioned against inferring a causal relationship in student achievement. These studies did not report findings on how working in the PDS affected student achievement, but instead described how the collaborative working environment affected the teachers. This type of research is more typical of PDS studies, and while valuable to the overall discussion of PDS schools, the question of how the model affects student achievement remains unanswered.

Even as more schools and universities partner to create PDS school relationships (NCATE, 2001), as the literature shows, there continues to be a disproportionate amount of research that directly links PDS schools to student achievement (AACTE, 2004; Taymans, Tindle, Freund, Ortiz, & Harris, 2006; Teitel, 2001, 2003). If the PDS model is to become a standard part of the design of colleges of education, the research needs to expand to include evaluating how the professional development of inservice teachers affects student achievement.

The purpose of this study was to examine the relationship between specialized training offered to inservice teachers in a professional development school and reading achievement. Evaluating the long-term effects of the PDS model as it relates to student achievement in reading and inservice professional development would add depth to the professional discussion and lay the groundwork for future research inquiries related to the PDS movement. It was expected that there would be a significant increase in reading achievement as measured on the Developmental Reading Assessment (DRA) test for the students who attended a PDS, and furthermore, there would be a relationship between the inservice professional development required by the PDS and the students' DRA scores.

Method

Participants

Twelve students participated in the study during their second and third grade. The study took place at Midway Elementary Professional Development School (PDS), a local urban PDS that opened in the fall of 2001. Midway Elementary PDS is a Title I pre-K – 5 elementary school with an average student enrollment of 324 students, with a population of 87% regular education students and 13% students with disabilities. African American students account for 100% of the student population, with 94% eligible for free or reduced lunch (LDOE, 2007). Of the original 61 kindergarteners enrolled during the first semester at Midway Elementary PDS in 2001, only 12 students were still enrolled at the end of the 2005-06 school year, who became the participants in this study.

Instrument

Data were collected using the Developmental Reading Assessment (DRA). The DRA is a set of individually administered criterion-referenced reading assessments for students in

kindergarten through Grade 3 to determine a student's instructional reading level. DRA includes a series of leveled books and recording sheets designed to allow teachers to determine students' reading accuracy, fluency, and comprehension levels. Students' scores are translated into reading level, and described in terms of Interventional, Instructional, Independent, and Advanced levels. The 90 – 94% range in accuracy represents the student's instructional level. A student's independent level is the level at which he/she reads with 95 -100% accuracy, with fluency, and comprehension. Students are determined to be near, at, or above grade level, below grade level, or significantly below grade level based on their performance on the assessment relative to their grade level status (Beaver, 1997).

Williams (1999) conducted a reliability check to examine (1) inter-rater agreement of teachers using the assessment, and (2) internal consistency of the DRA instrument. Additional data were obtained to examine the empirical validity as well. To determine the extent of inter-rater agreement among teachers/raters, Rasch rating scale analyses were conducted across 4-facets. Rasch (facet) rating scale analyses were employed to capture the multiple facets of the reading process and their interdependencies. The raters ($n = 3$), students ($n = 306$), text reading levels ($n = 19$), and items ($n = 5$) identified the facets. Items included rating scale responses indicated by teachers for students' rate of accuracy, level of understanding (comprehension), reading stage, phrasing, and reading rate. The rating scale responses to the items are the results of the interactions between the facets. Cronbach's alpha was employed to determine the internal consistency of the items and text. The item and text separation reliability in Rasch rating scale analyses are equivalent to Cronbach's alpha.

Analyses revealed that reliability between the originator and second rater was strong, i.e., inter-rater agreement between the first two raters was 0.80, when calculated across facets; inter-rater agreement among all three raters was not as strong. The inter-rater reliability among the three raters was 0.74 across students, text levels and items. The internal consistency was found to be quite strong for the five rating scale items, i.e., item separation reliability (Cronbach's alpha = 0.98), across all three raters as well as for the DRA assessment texts, i.e., text separation reliability (Cronbach's alpha = 0.97).

Data were also obtained from one school district to help establish the empirical validity of the DRA. To assess this validity, individual scores on the DRA for the second grade population ($n = 2,470$) at the end of the 1998-99 school year from a large urban/suburban school district were correlated with the students' scores from the fall of the third grade on the Iowa Test of Basic Skills Subscales: Vocabulary, Reading Comprehension, and Total Reading. All correlations were significant at the 0.01 level (2-tailed) using Spearman's Rho rank order correlation; however, the highest and most meaningful correlation for this assessment was with Total Reading ($r = 0.71$, $p < .01$).

Procedure

The present study looked at data over a two-year period during the 2003-04 and 2004-05 school years. The participants were pretested and post-tested during the fall and spring of each school year using the Developmental Reading Assessment (DRA) to test reading accuracy, fluency, and comprehension levels. Prior to the beginning of the study, classroom teachers received training on how to administer the DRA assessment.

Teachers at the study site (i.e., Midway Elementary PDS) were required to participate in a minimum 80 hours of annual on-site professional development training coordinated with the

partnering university. Training included best practices in reading instruction and all teachers were required to incorporate the instructional techniques into the classroom as outlined by school administration.

Comprehension, writing, and vocabulary are key areas that students require frequent and repetitive explicit instruction if students are expected to become skilled readers. Building and sustaining engagement is of primary concern, and must include effective, research-based strategies (Allington, 2006; Vacca, 2006). During the 2003-04 school year, the participants were in the second grade and were engaged in a minimum of three hours of reading, writing and language arts instruction. In their third grade participants also received a minimum of 3 hours of daily reading, writing, and language instruction. As shown by Tables 1-2, daily language and reading activities, included: (a) D.E.A.R. (Drop Everything and Read), (b) Daily Oral Language (DOL), (c) Word Walls, (d) school-wide Word of the Week, (e) Accelerated Reader, (f) Monthly Reading Initiative Programs, (g) cooperative vocabulary instruction, and (h) Language to Literacy.

Table 1
Example Literacy Instruction Schedule for Second Grade

Time	Monday	Tuesday	Wednesday	Thursday	Friday
08:00—08:30	DOL	DOL	DOL	DOL	DOL
08:15—08:30	Daily Journal	Daily Journal	Daily Journal	Daily Journal	Daily Journal
	Writing Activities	Writing Activities	Writing Activities	Writing Activities	Writing Activities
08:30—09:15	Language Arts	Language Arts	Language Arts	Language Arts	Language Arts
09:30—10:05	Language Arts	Language Arts	Language Arts	Language Arts	Language Arts
10:05—11:15	Reading	Reading	Reading	Reading	Reading
11:40—11:55	Reading	Reading	Reading	Reading	Reading

Table 2
Example Literacy Instruction Schedule for Third Grade

Time	Monday	Tuesday	Wednesday	Thursday	Friday
08:00—08:30	DOL	DOL	DOL	DOL	DOL
08:15—08:30	Daily Journal	Daily Journal	Daily Journal	Daily Journal	Daily Journal
	Writing	Writing	Writing	Writing	Writing
	Activities	Activities	Activities	Activities	Activities
09:00—10:35	Reading	Reading	Reading	Reading	Reading
10:35—11:35	Language	Language	Language	Language	Language
	Arts	Arts	Arts	Arts	Arts

Scheduling time for comprehensive literacy instruction is only the first step to increased student reading achievement as measurable on standardized assessments such as the DRA (IRA, 2002; NRP, 2000; Pressley, Wharton-McDonald, Allington, Block, & Morrow, 1998). Allowing sufficient time for instruction, however, will not sustain student growth. If students are to reach his or her potential, inservice teachers must receive on-going training in current best practices (Allington, 2006; Brown & Thomas, 1999; NCATE, 2006; Trachtman, 2007) and be held accountable for implementing those strategies into the classroom (Holmes Group, 1986, 1995; Klingner, Ahwee, van Garderen, & Hernandez, 2004; Trachtman, 2007).

Pretesting began in September of 2003 and 2004 and continued through October as needed and post-testing occurred in April of 2004 and 2005. Classroom teachers individually tested participating students during the teacher’s planning period. Testing occurred during one sitting, as suggested in the DRA administration manual, and results were scored by the individual classroom teachers who followed the DRA’s Observation Scoring Guide and Louisiana Comprehension Scoring Sheets provided by the publisher, Celebration Press. The testing rooms included a comfortable testing area void of potential distractions such as excessive noise and poor lighting.

Results

With a sample of 12 participants measured before and after the treatment, means and standard deviations for the DRA assessment were calculated for both the pretests and post-tests for the 12 participants. Correlated t-tests were run to determine whether the mean differences between the pretests and post-tests were statistically significant.

Results on the second grade scores were statistically significant, $t(11) = 5.90, p < .001$. On the average, students scored much higher on the post-test ($M = 27.00, SD = 5.43$) than on the pretest ($M = 16.58, SD = 8.03$). Similar findings were revealed for the third grade, $t(11) = 7.80,$

$p < .001$. Once again, students did a lot better on the post-test ($M = 36.17$, $SD = 5.88$) than the pre-test ($M = 27.83$, $SD = 5.15$).

Table 3

Means, Standard Deviations and t-test Results Revealing Mean Differences between Pre-test and Post-test scores in Second Grade and Third Grade

Test	N	Mean	SD	t	P <
2 nd Grade	12				
Pre-test		16.58	8.03		
Post-test		27.00	5.43	5.90	.001
3 rd Grade	12				
Pre-test		27.83	5.15		
Post-test		36.17	5.88	7.80	.001

During the 2003-04 and the 2004-05 school years, the 12 students who attended Midway Elementary PDS from its inception in the fall of 2001 until fifth grade showed significant gains in reading as indicated on the second-grade DRA assessment. On average, participants tested higher on the post-test with only two of the twelve scores indicating a decline in performance (one participant pretested above level and post-tested on-level, while the second was on-level at the pretest but below level at the post-test).

Positive outcomes also resulted from the third grade DRA assessment. Again, on average, participants scored higher on the post-test with only two participants showing a decline between the pretest and pos-test (one participant pretested above level and post-tested below level, while the second pretested on-level and post-tested below level). As illustrated by Table 4, of the two students who showed a decline in third grade post-test scores, it is important to note the amount of growth for *Student 1* between the fall of 2003 and the spring of 2004 (pretest score of 3, i.e., below level, and post-test score of 24, i.e., on-level).

Table 4
DRA Scores for Each Participant

Comparison of DRA Results

DRA - 2nd Grade 2003/04		DRA - 3rd Grade 2004/05	
Exact Level Fall	Exact Level Spring	Exact Level Fall	Exact Level Spring
*16 = on *20 = above	*24 = on *30 = above	*24 = on *30 = above	*34 = on *40 = above

Student 1	3	24	30	30
Student 2	16	30	30	40
Student 3	24	30	30	40
Student 4	4	16	16	30
Student 5	20	24	24	30
Student 6	14	30	30	40
Student 7	30	34	34	40
Student 8	20	30	30	40
Student 9	16	18	20	24
Student 10	10	28	30	40
Student 11	18	30	30	40
Student 12	24	30	30	40

For the same student, the 3rd grade pretest score (30, i.e., above level) revealed a sustained increase from the previous year, with the decline only occurring during the post-test at the end of the third grade (30, i.e., below level). Although *Student 1*'s final post-test score in the third grade indicated that the student was below level, the score was only 4 points below the 34 minimum to be considered on level. Analysis of professional development records did not glean plausible causes for the decline, such as the introduction of a new teacher midway through the school year.

A similar growth pattern emerged for one of the participants who post-tested below level at the end of third grade (*Student 4*). Second grade pretest results indicated the student was below level (score of 4), as did the post-test results (score of 16). Third grade scores indicated growth, with a pretest score of 16, but still below level, and a post-test score of 30 (below level). Possible extraneous causes of the decline were not noted after reviewing professional development files. *Student 4* remained below level during the study, but as with *Student 1*, the final post-test score at the end of third grade posted only 4 points below the required score of 34 to be considered on-level.

Discussion

In addition to examining a promising increase in reading achievement of the 12 participants at this PDS, the present study sought to explore a possible relationship between the inservice professional development required by the PDS and the reading achievement of students as measured on the Developmental Reading Assessment (DRA) test. According to Teitel (2003), establishing causality through treatment and control schools is virtually impossible. However, examining studies such as this one provides opportunities for researchers and educators to make plausible links that suggest effectiveness.

Increased inservice teacher professional development has been reported to have a positive effect on student achievement (Holmes Group, 1986, 1995; Klingner, et al, 2004; Trachtman, 2007). The Holmes Group (1995) asserted that competent teachers consider multiple ways to deliver instruction to students who find it difficult and frustrating. Students benefit from increased teacher skill, including specific areas of instruction. Professional development inservice training at Midway Elementary PDS is documented and supported by research as to the potential positive effect on student achievement (Darling-Hammond, 1996; Darling-Hammond & Berry, 2006; Darling-Hammond, et al, 2005; NCATE, 2006). Inservice teachers working at this PDS were required to obtain a minimum of 80 hours of professional development training, though only 30 hours were required by the state to retain licensure (LDOE, 2007). All teachers at this PDS were required to implement the same strategies and practices taught in development workshops into the classroom. The principal required evidence of compliance on a routine basis, including indicating use on weekly lesson plans, as well as providing student samples demonstrating the implementation in the classroom. Additionally, the principal held meeting with the staff to discuss all aspects of lesson planning to ensure that the campus maintained focus on the set objectives, to discuss possible problems, brainstorm solutions, and provide the necessary time for teachers to work in collaborative settings and demonstrate lessons to their peers (Pullen, P., personal interview, April 4, 2008).

Levine and Trachtman (1997) stated that PDSs are directly related to professionalism and that a characteristic of professional teaching is a strong knowledge base and a commitment to continuous improvement. Castle and Rockwood (2002) reported in a longitudinal study (three years) gains on three reading tests and two writing tests, linking curriculum innovations taking place in the PDS (flexible grouping and professional development) to document how the PDS had affected the methodologies of the classroom teachers. They specifically describe how the PDS environment facilitated teacher learning and altered practices to contribute to the gains of the students. Professional development training at this PDS site (i.e., Midway Elementary PDS) produced similar instructional changes and focused areas of study that support a relationship between the reading achievement as indicated by the DRA scores and the inservice professional development of the PDS in-service teachers.

Although the findings from the present study are encouraging, this study, as any research investigation, has a few limitations. The location for this study was chosen because of its relationship with the partnering university. Midway Elementary PDS is located in an urban community with a high transient population, which thereby limited the total amount of students who attended the school from its inception in 2001 through the end of fifth grade. As previously noted, of the original 61 kindergarteners enrolled in the fall of 2001, only 12 remained at the end of the fifth grade. Because of the transitory nature of the student population, the restricted sample size could not be controlled.

Assessment results were not compared to a non-PDS school matched in areas of student population or teacher qualifications. This decision was made to reflect the lack of information that can be obtained from accessing published DRA results for the state of Louisiana. Although results for similar schools are made public on the Louisiana Department of Education website (LDOE, 2005) no specific pre and post-test scores for individual students were available. DRA results in this study included pre and post-test results for individual students, so a comparison to similar schools would have required more information than could be gleaned from public records alone.

In the state of Louisiana, a teacher must obtain 150 Credit Learning Units (CLUs) every five years to renew certification, which averages to 30 hours per year of professional development (LDOE, 2007). Comparison data were not obtained to document if inservice teachers working in the area at non-PDS obtain more professional development training each year than the state minimum. Furthermore, no comparison data were obtained to compare what type(s) of training is made available to teachers employed in a non-PDS and how that training must be implemented in all classrooms.

This study adds to the current discussion and explores one aspect of this PDS model, intense professional development, as set forth by the relationship between the PDS and its partnering university. More research is needed to examine the relationship between student achievement and the PDS model as compared to non-PDS. One area to explore is the increased amount of professional development required at this PDS as compared to other PDS. Does the amount of required inservice professional development affect student learning or does another element, such as the long-term strategic nature of the training, increase achievement? How much inservice professional development is required at other PDSs?

Research on the effects of the PDS model as it relates to student achievement is rather limited. Even with the continued rise of the PDS movement throughout the nation, literature continues to focus primarily on exploring the effectiveness of the program as it relates to pre-service preparation. As student expectations and outcomes continue to rise, public schools will continue to search for ways to increase student achievement in an effort to meet rising educational demands. Teacher preparation does not end upon graduation and certification, but remains a continual process throughout one's career. Staff development, if expected to remain viable, should be explicitly linked to student learning. Doing so creates an atmosphere where classroom teachers are more willing to re-conceptualize teaching and learning because observable changes in student learning become an integral part of the classroom design (Englert, Tarrant, & Rozendal, 1993). The results presented in this study hold promise and demonstrate why exploring the collaboration between a university and the partnering school creates innovative atmospheres where all participants, including the most important – the student – flourish.

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