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Investigating the Effects of an Experimental Approach to Comprehension Instruction within a Literacy Clinic

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Abstract:
Reading comprehension levels of elementary students have not significantly improved in the 21st century and as a result, the need for systematic and intensive reading interventions is as high as ever. Literacy clinics are an ideal setting for struggling readers to experience success through the implementation of a cyclical approach to individual assessment, planning, instruction, and evaluation. Yet, additional research is needed to create current and relevant models of literacy clinics for today's diverse learners. This investigation aimed to measure the effects of an experimental approach to reading comprehension instruction for third graders within an off-campus literacy clinic; the intervention involved a scope and sequence of comprehension strategies in which students had to demonstrate skill mastery before progressing to the next skill. There was a statistically higher achievement rate in the experimental group as measured by the CRCT statewide assessment with a Cohen's effect size value (d = .79) suggested a moderate to high practical significance. Its findings are relevant to those involved in literacy improvement, including literacy clinic directors, preservice educators, and curriculum directors.

Keywords: literacy, reading clinics, intervention, remediation, individualized instruction, elementary

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School-wide literacy success has been nearly a universal goal since the inception of the No Child Left Behind Act, the Common Core State Standards, and now the Every Student Succeeds Act. Having rigorous expectations alone is not enough (Cassidy, Ortlieb, & Grote-Garcia, 2016); advancement occurs from building on what has worked and taking informed risks. Refining and tuning existing programs of excellence is incredibly difficult work that often goes unrealized (Ricci, 2011). Nevertheless, more research is needed within turn-around pedagogies

(Comber & Kamler, 2012) for students who experience difficulties developing reading skills and comprehension of what they read in print and digital environments, as concepts of capable learners struggling to read are merely 120 years old (Harris, 1967; Ortlieb, 2012).

As a university partner to a local school, it was the lead investigator's role to develop a creative approach to strengthen its existing excellence through redesigning its off-campus university reading clinic. A review of disaggregated formal assessment data from third grade students' standardized tests revealed that students needed improvement in predicting, summarizing, and questioning skills. Although it was not surprising that third graders struggled with aspects of reading comprehension, it was commonly perceived that these areas were being addressed via whole class instruction as well as in the clinic's tutoring sessions.

As a result of the identified needs, investigators created a plan for change that entailed preservice educators creating 60-minute biweekly lessons that infused more explicit, research-based instruction tailored to these comprehension skills. This study aimed to determine if an experimental approach to reading comprehension instruction could improve comprehension scores for struggling readers in a literacy clinic.

Theoretical Framework

This research project is grounded on notions of explicit sequencing of skills (Ortlieb, 2014) towards cognitive development and schema acquisition (Bartlett, 1932). Within the development of reading skills, sequences include strategies such as prediction, previewing, and summarizing. These techniques share the common ground of encouraging learners to use their existing knowledge towards acquiring new information and ideas in a text (Anderson & Pearson, 1984; Ausabel, 1968; Pearson & Johnson, 1978; Stauffer, 1976, 1980). Schema is a concept that describes how knowledge experiences are stored and play a role in the comprehension process (Anderson, Reynolds, Schallert, & Goetz, 1976; Bartlett, 1932). Students' varied background knowledge and experiences lead to different levels of understanding of a text or different interpretations (Anderson et al., 1976).

Connective understandings, or the creation of informational bonds, need to be modeled and taught to children. Schema is the foundation to comprehension in literacy. In school, educators often assume that students have prior background knowledge that will take them to the level of comprehension that is needed for academic and career success. Part of comprehension development consists of using prior schema to fill in "gaps" created by new knowledge (Anderson et al., 1976). Readers have to make sense of the new knowledge gains by connecting it with prior knowledge by using logical inferences. For schema to make sense, these thoughts also have to repeat in the order that they originally occurred (Bartlett, 1932). This makes the process of gathering schema more accessible in order to reach full comprehension. The reader has to construct meaning from the message and schema (Anderson et al., 1976).

Scaffolding is intended to serve as a temporary structure in supporting students in overcoming their struggles (Dixon, 1994; Ortlieb, Grandstaff-Beckers, & Cheek, 2012) and leading them towards independent literacy success (Tompkins, 2014). Providing modeling to learners allows them to develop their literacies as apprentices and contributors to their own learning (Kucer, 2014; Williams & Ortlieb, 2014). Applying the schema theory of learning to this study encourages literacy development by building on background knowledge and observations to understand more complex content (Hinrichs, 2004; Reznick, 1983).

Review of Literature

A myriad of research-based literacy methods and strategies currently prevail in the field of reading education (Block, Parris, & Morrow, 2008; Rasinski & Padak, 2008; Walpole &

McKenna, 2004). While acknowledging individual successes in programs around the nation, hearty problems remain in the field of reading. Despite significant efforts since 1992, the national state of 4th grade reading scores has stagnated (U.S. Department of Education, 2013). As many states have recently adopted (and even repealed) the Common Core State Standards (CCSS), perhaps core reading programs could benefit from alternative means of literacy improvement.

Literacy Clinics

A literacy clinic is a site where K-12 learners can attend sessions with preservice or inservice teachers who hone their pedagogical skills through delivering an individualized plan for literacy improvement, often occurring in a one-on-one setting. Literacy clinics have been an integral part of successful reading programs for many decades (Bates, 1984; Smith, 1965/2002). However, literacy clinics remain a scantly researched field (Cassidy, 2009; Garrett, Pearce, Salazar, & Pate, 2006). Interest in literacy clinics has fluctuated primarily due to financial costs and time considerations (Bader & Wiesendanger, 1986). Yet, the support system that literacy clinics provide to participants including students, tutors, and clinicians is a staple to their success and unlike any other (Elish-Piper, 2001; Hanes & Mulhern, 1981). Using models designed decades ago primarily for Caucasian students may not be a viable option; instead, models of modernized literacy clinics must be created to provide the framework from which success for all is fostered (Cleland, 1982; Ortlieb & Doepker, 2009).

The ability to read effectively is particularly salient for success today in a fast-paced society. Early intervention combined with appropriate assessments and subsequent instructional methods may eliminate the need for reading intervention in later grades (Foorman et al., 1998; Snow, 2002; Wanzek & Vaughn, 2010). Evidence indicates that the number of children with reading difficulties can be reduced from current levels (20-40%) to a much lower percentage with comprehensive, systematic, and intensive reading interventions (Invernizzi, 2003; Torgesen, 2000). Hence, students should have access to immediate and intensive interventions to ensure optimal progress; a literacy clinic is a suitable forum for accomplishing just that (Houge & Geier, 2009).

Literacy clinics afford teachers the time and effort to concentrate on instructional practices directed towards individual students. Within clinics, teachers can modify, expand, polish, and experiment with instructional practices designed to improve students' abilities in multiple literacies. Through a cyclical approach to individual assessment, planning, instruction, and evaluation, struggling readers can experience success (Dunston, 2007; Ortlieb & Cheek, 2008), which is the undisputable best educational motivator. Literacy clinics provide a useful alternative to the available programs by offering components like a thorough assessment and a personalized plan for instruction; they also foster student motivation, attitude, and skills (Bracken, 1967; Fernald, 1943; Johns & Lunt, 1975).

Comprehension Strategies

Effective reading programs are composed of not only teaching techniques but also strategies for students to improve their comprehension of complex texts and text structures. Strategies that good readers use must be explicitly taught regardless of the grade level. The strategies must be aimed at transferability, that is, students can use them across disciplinary areas and grade levels, as their importance is significant to understanding fiction and non-fiction topics. The primary investigator decided to focus on strategies for the improvement of text comprehension derived from Duke and Pearson's book chapter- *Effective Practices for*

Developing Reading Comprehension within Farstrup and Samuels' (2002) *What Research Has to Say about Reading Instruction.*

Good readers apply a host of strategies to read and interpret the meaning of text (Pressley, 2000; Wade, 1990). Explicit instruction of *prediction* leads students to predict and constantly adjust those predictions throughout their active reading experiences (Allbritton, 2004; Caverly, Hand, Franke, & Radcliffe, 2008; Eilers & Pinkley, 2006). Effects of using strategies like prediction include increased levels of metacognition, especially in struggling readers (Brownwell, Golos, Klinger, Menon, & Urbach, 2010). *Think alouds*, or the reader's verbal thoughts, depict what reading strategies are being used and create a focused reading environment around the task at hand (Smith, 2006). Understanding content, though, begins with identifying and analyzing the arrangement of ideas or *text structure* (Armbruster, 2004). Then, readers can use *visual representations of text* and/or *summarizations* to concisely explain their understanding of the text resulting in increased levels of comprehension (Haystead & Marzano, 2009). Having the ability to delete unnecessary information, select a topic sentence, and maintain sequence of events is of primary focus when summarizing (Boulware-Gooden, Carreker, Thornhill, & Joshi, 2007). *Questions/questioning* strategies promote critical thinking skills that focus on the construction of meaning and interaction with the text (Parker & Hurry, 2007; Trinkle, 2009). These six strategies were selected to aid students' comprehension in this quasi-experimental study by equipping them with skills necessary to be thoughtful independent literate consumers of information.

Just as Bader and Wiesendanger (1986) noted that major changes occurred in reading clinics during the 1980s, literacy clinics should evolve today to meet 21st century needs. More research is needed to formulate optimal models of literacy clinics. This investigation aims to determine the effectiveness of an experimental scope-and-sequence approach to comprehension strategy instruction in the third grade within an off-campus literacy clinic.

Methods

Participants

After obtaining IRB approval, investigators conducted an analysis and found that 93.4% of third graders met or exceeded benchmarks for achievement on the state-wide standardized test, Criterion-Referenced Competency Test (CRCT), in 2009. Of the 139 (73 male/66 female) third graders' CRCT scores, the lowest 60 scorers (36 male, 24 female) were selected for inclusion in the 'study buddy' program including two who were repeating third grade (Caucasian 62%; African American 24%; Hispanic 8%; Other 6%). Their ages ranged between 8 and 10 years old. Each third grader was randomly paired with a university senior-level student majoring in early childhood education. This off-campus literacy clinic program was a coordinated effort between the nearby university and this elementary school, where preservice educators tutored students at Southside Elementary to remediate their difficulties in literacy led by their university professor.

Participatory third graders were pulled from their physical education class twice per week to receive supplementary one-on-one clinical instruction. All third grade teachers at Southside Elementary used the *Open Court* reading program. This research-based, systematic, and comprehensive framework is primarily structured around a scripted basal reader inclusive of a scope and sequence of reading strategies that begins with word knowledge and moves on to comprehension via authentic literature.

University students were fulfilling requirements for completion of their undergraduate early childhood program. The 20-hour practicum for 10 consecutive weeks in a semester

included informal pretesting, progress monitoring, semi-structured lessons, and post-testing. Preservice teachers received three courses related to reading education, and one course in language arts prior to participating in the literacy clinic. Tutors participated in workshops detailing how to proctor, score, and interpret informal reading inventories. Preservice teachers were also educated before, during, and after the tutoring process about designing effective lesson plans for struggling readers. Emphasis was placed on the tutoring portion of the course as it was the preservice educators' role to provide opportunities for elementary student success within the university partnership. The literacy clinic director scheduled weekly observations of tutoring sessions to provide ongoing feedback and guidance. In instances of student absenteeism, university preservice teachers collaborated with another group.

Design/Procedure

A quasi-experimental study ensued as half of the literacy clinic participants (30) were randomly assigned to be included in an experimental group, while the others (30) were designated in the control group. Though the treatment assignment was randomized, a *t*-test was conducted to compare the preexisting level of reading achievement as measured by the previous year-end CRCT. Among 3rd graders in the research study (n = 60), there was no statistically significant difference between the two groups, Treatment group (M = 825.4, SD = 14.21) and Control group (M = 828.1, SD = 20.38), $t(58) = 0.5952$, $p \geq .05$, $CI.95$ -11.78, 6.38. Essentially, both groups scored similarly and as a result, intervention gains, if any, could be compared after its duration to determine if the experimental approach to clinical instruction had a significant effect on reading comprehension of third graders.

The independent variable in this investigation was the scope and sequence for explicit comprehension strategies. The control group of third graders received instruction using the traditional lesson plan that included a list of reading comprehension strategies for which their tutors selected one or more each day to target based on their book selections and applicability to the created lesson (see Figure 1).

In contrast, students in the experimental group used a modified lesson plan inclusive of a scope and sequence of reading comprehension strategies (see Figure 2). Comprehension strategies included in the scope and sequence (prediction, think-aloud, text structure, visual representations of text, summarization, and questions/questioning) on the lesson plan were derived from Duke and Pearson's (2002) summary of research-proven explicit techniques for reading comprehension development. The order of strategies on the experimental lesson plan reflects an approximation of the scope and sequence of strategies taught in third grade within three popularly used basal reading series in the United States. Preservice educators in the experimental group began with the first comprehension skill (predicting) and continued addressing that skill until a student demonstrated mastery as measured by a standardized strategy use rubric. There was also a minimum of two days of tutoring per skill to ensure that a student maintained mastery, and that multiple measures (i.e., work sample completion, rubric rating, and/or direct observation of strategy use) provided a sufficient evidence base before moving to the next comprehension skill. The null hypothesis (H_0) was that there would be no difference between control and experimental groups' reading comprehension improvement over 10 weeks of tutoring.

Three dependent measures were used in this study: a) Oral reading comprehension scores obtained from the Qualitative Reading Inventory-4 (QRI-4) (2005), featuring an alternate-form reliability of .80 (Leslie & Caldwell, 2005); b) Silent reading comprehension scores from the QRI-4; and c) Georgia state-wide standardized test (CRCT) scores in reading for elementary

<table>
<tr><td>Read Aloud (optional)</td><td colspan="2"><u>Guided Reading</u> (Book Title)</td></tr>
<tr><td rowspan="2"><u>Familiar Rereading</u>
<u>Book Title or Chapter</u>

<u>Strategies Used/Neglected</u>
➢
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➢</td><td><u>Before Reading</u></td><td><u>During Reading</u>
Teacher will:

Student will:</td></tr>
<tr><td><u>After Reading</u></td><td><u>Comprehension Strategies Used</u>
□ Text Structure
□ Questions/Questioning
□ Think Aloud
□ Summarization
□ Visual Representations of Text
□ Prediction</td></tr>
<tr><td><u>Assessment/Evaluation</u>

Target Area(s): □ Comprehension
□ Fluency
□ Vocabulary
□ Other _____

Data/Evidence:</td><td colspan="2">Comprehension Extension Activity:</td></tr>
<tr><td><u>Observations of student behavior(s)</u>
Student’s Improvements:

Student’s Struggles:</td><td colspan="2"><u>Vocabulary Strategies</u>
□ Direct Instruction
□ Context Clues
□ Word Parts
□ Word Consciousness

Activity:

Words Used:</td></tr>
<tr><td><u>Reflections</u>
How successful was the lesson?

What do you need to do differently?

What does the student need to learn next?</td><td colspan="2"><u>Interactive/Guided Writing</u>
Objectives: (Skills/Strategies Taught)

<u>Objective 1:</u>
Activity:

<u>Objective 2:</u>
Activity:</td></tr>
</table>

Figure 1. Literacy lesson plan (control group).

<table>
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</table>

Figure 2. Literacy lesson plan (experimental group).

grades. Pre- and post-test scores on the QRI-4 were collected by tutors during the first two and last two tutoring sessions, allotting 16 of the 20 sessions for skills-based tutoring.

The Georgia state-wide standardized test (CRCT) Grade 3 reading component is designed to measure knowledge, content, and skills in the following areas: a) Reading Skills and Vocabulary Acquisition; b) Literary Comprehension; and c) Reading for Information. The standardized test consisted of three or four multiple-choice questions that follow literary passages. This standardized assessment was used to measure the differential between elementary students' scores at the end of the second grade versus the end of the third grade. In addition to the between-group comparisons, students involved in the off-campus literacy clinic were also compared with other third graders at Southside Elementary who did not participate in the study buddy program. The primary investigator collected all standardized test scores with district and school permission.

Participant Training

Data collectors (preservice teachers) were trained in the administration and scoring of the QRI-4. They were first provided with a presentation by the primary investigator on the theory and rationale for QRI-4. The investigator modeled implementing QRI-4 with a third grade student as well as passage scoring procedures. Data collectors practiced administering and scoring the responses.

Data Analysis

Mean scores and standard deviations from experimental and control groups were calculated from the three indicators: informal oral reading comprehension, informal silent reading comprehension, and formal reading comprehension. A t-test was performed to compare differences between means for informal pretest and posttest scores for both oral and silent reading comprehension within and between groups. A t-test was also utilized to evaluate the means and standard deviations from the formal, state-issued CRCT between the two groups, as well as to compare the progress of students in the clinic versus other third graders at Southside Elementary. Cohen's effect size was used to demonstrate the strength of the correlations.

Results

IRI Oral and Silent Scores between Groups

The results of the quasi-experimental design study indicate there was no statistically significant difference between the oral reading gains (measured in grade level equivalents) of the control group (M = 1.45; SD = 1.30) and the experimental group (M = 1.5; SD = 1.69), $t(55) = 0.13$ $p \geq .05$, $CI_{.95}$ = -.085, 0.75 (see Table 1) using the informal measurement. Therefore, we fail to reject the null hypothesis that there is no difference between the instructional approaches to oral reading comprehension development, as evidenced by the informal reading inventory scores on the QRI-4.

On the subsequent silent reading comprehension test, students again increased their scores with close resemblance between control and experimental groups. Gains in silent reading comprehension of the control group (M = 1.21; SD = 1.80) were comparable to those of the experimental group (M = 1.22; SD = 1.37), $t(55) = 0.98$ $p \geq .05$, $CI_{.95}$ = -0.86, 0.84 (see Table 1). Again, we fail to reject the null hypothesis there is no difference between approaches to instruction on silent reading development, according to QRI-4 scores.

CRCT Scores between Groups

Among 3rd graders at Southside Elementary who maintained participation in the reading clinic (N= 57), there was a statistically significant difference between the two groups, control group (M = -3.66; SD = 14.17) and the experimental group (M = 5.56; SD = 8.69), $t(55) = 2.95$, $p \leq .05$,

$CI_{.95}$ = -15.49, -2.95 (see Table 2) on this formal, standardized measure. Therefore, we reject the null hypothesis that there is no difference in reading scores between the improvements to reading comprehension between the two groups. Further, Cohen's effect size value (d = .79) suggested a moderate to high practical significance. Two students scored below the 800-point passing mark with each earning a score of 795 respectively. One of the two students had already repeated third grade and improved his score by 14 points from 2013 to 2014.

Table 1
IRI Oral and Silent Scores of Control and Experimental Groups

	n	*M*	*SD*	*t*	*df*	*p*	*95% CI*
IRI Oral Scores							
Control	29	1.45	1.30	–	–	–	–
Experimental	28	1.50	1.69	–	–	–	–
Total	57	1.47	1.49	0.13	55	0.9006	-0.85, 0.75
IRI Silent Scores							
Control	29	1.21	1.80	–	–	–	–
Experimental	28	1.22	1.37	–	–	–	–
Total	57	1.21	1.59	0.02	55	0.9813	-0.86, 0.84

Table 2
CRCT Differential Scores from 2013 to 2014 between Groups

	n	*M*	*SD*	*t*	*df*	*p*	*95% CI*
CRCT Scores							
Control	29	-3.66	14.17	–	–	–	–
Experimental	28	5.56	8.69	–	–	–	–
Total	57	2.29	11.48	2.95	55	0.0047	-15.49, -2.95

CRCT Scores between Clinic Participants and Non-Participants in the Third Grade

Improvements from 2013 to 2014 on the CRCT of participatory students (M = 5.56; SD = 8.68) in the study buddy program (lowest scorers on 2009 CRCT) were slightly higher, but not statistically significant compared to the scores of non-participatory students (M = 4.12; SD = 5.27), $t(134) = 1.20$, $p \geq .05$, $CI_{.95}$ = -0.93, 3.81 (See Table 3). Thus, we fail to reject the null hypothesis that there is no difference in comprehension development for students in the reading clinic and non-participatory third graders at Southside.

Table 3
CRCT Scores between Clinic Participants and Non-Participants in the Third Grade

	n	*M*	*SD*	*t*	*df*	*P*	*95% CI*
CRCT Scores							
Participants	57	5.56	8.68	–	–	–	–
Non-participants	79	4.12	5.27	–	–	–	–
Total	136	4.72	6.70	1.20	134	0.2321	-0.93, 3.81

Implications

Informal reading inventory test results indicate that students in the reading clinic developed approximately 1.5 grade levels in oral reading comprehension and 1.25 grade levels in silent reading comprehension (as measured by the QRI-4) regardless of their inclusion in the experimental or control group. The only significant difference between the two groups was detected in the formal testing posttests measured by the CRCT, where students in the experimental group outperformed their peers in the control group to a statistically significant rate.

Although students in the control group (where preservice teachers selected comprehension strategies that coincided with texts of their choosing) increased both their oral and silent reading comprehension abilities as measured by the QRI-4 instrument, their scores on the formal CRCT declined from 2013 to 2014. Meanwhile, those in the experimental group had additional opportunities to master comprehension skills, but may have not received instruction on all six strategies listed on the lesson plan. Students in the experimental group improved their scores significantly more than those in the control group; thus, reinforcing the notion of depth over breadth within educational settings (Kornhaber, 2001).

Although control group participants were exposed to all six comprehension strategies throughout the 10 weeks of reading intervention, some students likely failed to master some of those strategies and in turn, struggled to transfer the use of those comprehension reading strategies to independent tests such as the CRCT. Tutoring sessions were structured in a one-on-one format with heavy emphasis on teacher facilitation and scaffolding. However, it is apparent that scaffolding from teacher directed strategies/reading toward independent reading and the application of those strategies did not fully transpire (Pearson & Gallaher, 1983). In turn, standardized test scores did not show improvement in the control group. These outcomes have significance in school systems, tutoring programs, and other remedial courses.

While the differences in the improvements was not statistically significant between study buddy participants to non-participatory third graders at Southside Elementary, the fact that the struggling readers improved to a greater but similar extent to students who had already mastered many reading strategies prior to beginning third grade supplies evidence that the study buddy program provided opportunities for growth and development in literacy for its at-risk participants. These teacher-led sessions assisted to develop their particular needs in reading comprehension.

Limitations

Of the initial 60 students in the study, 57 completed the intervention and all of the testing. A few students (N = 3) in the study either relocated or were withdrawn from the study buddy program prior to the 10^{th} week when post-testing occurred. In addition, the second grade and third grade formal CRCTs are not identical tests. The CRCT was used as a second measure of reading comprehension before and after the tutoring process.

Further Study

Literacy clinics have consistently and historically demonstrated that participants enhance their abilities to effectively use literacy strategies (Ortlieb & Cheek, 2013). Clinics are an optimal environment to explore and refine approaches to literacy remediation.Literacy remediation will advance alongside experimental research. One particular avenue of needed research is determining the most effective scope and sequences for specific types of reading difficulties. For instance, students identified as word callers can be put into several programs of intervention, where research can yield data regarding which instructional approaches are most

effective. With revitalization in the popularity of literacy clinics, it is an ideal time to determine best practices in literacy clinics.

Conclusion

Though the basic tenets of reading are universally understood to be word reading and subsequent comprehension, knowing how to precisely teach these strategies to individual children is challenging. This investigation supported what is known from extant literature in that schema acquisition occurs from building on background knowledge and making connections in a carefully and pragmatically scaffolded environment that is highly individualized, student-centered, and constructed from high interest reading materials. Using a bevy of pedagogies and approaches to support reading skill development and content knowledge acquisition is necessary for students, especially those who have previous experienced difficulties in literacy. It is through refined research and practice (not delivering scripted curriculums) that educators become enhanced in their abilities to foster reading development from emergent to complex literacies, and then apply those skills in independent learning environments and real-world scenarios.

One method of instruction does not behoove every population of students and their unique schemas; methodological evaluations supply the evidence base for a delineation of their strengths and emerging skills necessary to plan for instructional success. In this study, comprehension strategies were targeted based on trends in standardized test performance, leading towards greater levels of comprehension and higher test performance following one year of targeted instruction. Classroom teachers and administrators alike can similarly improve upon their teacher performance by conducting similar evaluative inquiries and directing their efforts towards the commensurate needs of their student body.

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