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The Effects of a Small-Group Direct Instruction Intervention on
the Reading Achievement of English Language Learners

Laurie Ottehenning

A thesis submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of
Educational Specialist

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ABSTRACT

The Effects of a Small-Group Direct Instruction Intervention on the Reading Achievement of English Language Learners

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This study analyzes the effects of a Tier 2, small group intervention developed by the Exemplary Center for Reading Instruction (ECRI) that employs direct instruction strategies (including scripted sequenced lessons, teacher modeling, and repeated practice). The reading achievement of 15 English language learners (ELLs) in the ECRI intervention was compared to the reading achievement of 12 ELLs in a computer-based reading intervention. The reading achievement of 27 ELLs was also compared to the reading achievement of 48 non-ELLs in the interventions. Repeated measures ANOVAs and independent *t*-tests analyzed the results of the Kaufman Test of Educational Achievement-II Brief, pre- and post-tests. ELLs in grades 1-3 improved from pre- to post-test in the ECRI condition. In grades 1-3, both ELLs and non-ELLs in the ECRI condition significantly improved. ELLs in both conditions significantly improved in grades 4-6. In grades 4-6, there was a significant difference between ELLs and non-ELLs in the ECRI condition at pre-test but the difference was no longer significant at post-test. Implications and limitations of the findings are explored.

Keywords: direct instruction, English language learners, reading, response to intervention

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CHAPTER 1

Introduction

In 1997, Congress asked the Director of the National Institute of Child Health and Human Development to consult with the Secretary of Education in forming the National Reading Panel (National Reading Panel, 2000). The National Reading Panel examined thousands of experimental and quasi-experimental studies that researched reading. From the mass of studies, the Panel pulled out five “big ideas” that are crucial to reading development: the alphabetic principle, phonological awareness, vocabulary, fluency, and comprehension. The National Reading Panel also found that the majority of current research supports teachers’ using direct, explicit, and systematic instruction to teach reading.

After the National Reading Panel released its report in 2000, a new panel was created to review the research on teaching English language learners (ELLs) to read called the National Literacy Panel on Language Minority Children and Youth (August & Shanahan, 2006). This panel found that the same five big ideas of reading are also important for ELLs who are learning to read, as long as teachers adjust instruction to target their ELLs. Furthermore, the National Literacy Panel in 2006 found that ELLs benefit, just like English-only students, from direct, explicit instruction.

Research shows that teachers can use direct instruction to effectively teach reading. Teachers can use explicit instruction to teach reading skills to general students, struggling students, and ELLs. This study will explain the ideas behind direct instruction, delve into some common direct instruction programs, examine teacher perceptions of direct instruction, and discuss research that shows how direct instruction can benefit general, struggling, and ELLs. In this study, data were analyzed from a local elementary school with a high ELL demographic that

employed a small group, direct instruction intervention to teach reading to struggling students. The reading achievement of ELLs in the intervention were compared to those of ELLs in a computer-based reading intervention. The reading achievement of ELLs in the interventions were compared to reading achievement of non-ELLs in the interventions. It was hypothesized that ELLs will significantly improve in reading achievement after participating in a small-group, direct instruction reading intervention. It was also hypothesized that ELLs will make similar gains in reading achievement when compared to their non-ELL peers in the direct instruction Exemplary Center for Reading Instruction (ECRI) intervention.

CHAPTER 2

Literature Review

Direct Instruction

Direct, or explicit, instruction is a structured and organized teaching method often used to teach complex skills like language, reading, and math (Flynn, Marquis, Paquet, Peeke, & Aubry, 2012). Ryder, Burton, and Silberg (2006) identify three basic principles of direct instruction: (a) the teacher breaks down the skill into smaller parts that can be taught in isolation; (b) the teacher directs learning; and (c) students have little input into the lessons. Direct instruction methods consist of teacher-driven, focused, and organized strategies.

A meaningful teacher-student interaction plays an important role in direct instruction. Teachers using direct instruction will relate past learning to the new skill, explain why the new skill is important, spark interest in the new skill, provide step-by-step instructions, model the new skill, guide the students as they practice, and allow students to practice the new skill independently (Rupley, Blair, & Nichols, 2009). Shippen, Houchins, Steventon, and Sartor (2005) outline a more general three-step direct instruction process: “[Teachers] model (provide the correct response), lead (have the student say the correct answer with the teacher), and test (give immediate feedback and a delayed probe on the task initially attempted)” (p. 176). Although direct instruction is generally considered a well-structured style of teaching, Rupley and colleagues (2009) assert that the type of skill being learned affects the degree of teacher directness and control. Thus, teachers must be attentive to both the skill they teach as well as the reception of the skill by the students. If the students struggle with the skill, the teacher should assess whether reteaching is needed (Ryder et al., 2006). Rupley et al. (2009) further emphasize,

“the key to direct/explicit instruction is the active communication and interaction between teacher and student” (p. 127).

As briefly mentioned, teachers using direct instruction rely heavily on modeling as a method to help students understand a particular skill. Regan and Berkeley (2012) believe “modeling is a necessary stage of effective instruction that helps students to conceptualize and apply new skills and strategies” (p. 276). Modeling involves teachers providing the correct response or desired behavior so students can better understand what accurate employment of a skill looks like (Shippen et al., 2005). Modeling rests at the heart of the direct instruction method along with explicit explanations and guided practice (Rupley et al., 2009). As with determining the level of structure, the degree of explicitness when modeling “depends on what is being learned and the learner’s needs” (Regan & Berkeley, 2012, p. 276).

Increased opportunities to respond (OTRs) is an effective instructional strategy that is often integrated into direct instruction teaching methods (Haydon, MacSuga-Gage, Simonsen, & Hawkins, 2012). OTRs involve a teacher prompt or question, a student response, and teacher feedback (Haydon et al., 2012). Teachers can prompt individual students or require choral responding, which involves the entire class (Haydon et al., 2012). In concert with direct instruction, increasing OTRs acts as an effective classroom management technique (Simonsen, Myers, & DeLuca, 2010). Increasing rates of OTRs can lead to decreases in disruptive behavior and increases in on-task behavior, academic performance, and number of correct responses (Haydon et al., 2012; Simonsen et al., 2010). In one case study, a teacher increased OTRs using a choral responding procedure. The student’s on-task behavior and number of correct responses increased while the student’s disruptive behavior decreased (Haydon, Mancil, & Van Loan, 2009). Another single-subject study compared the effects of different levels of OTR on the

retention of sight words with a child identified as moderately mentally retarded (Burns, 2007). The study compared moderate levels of OTR to high levels of OTR and found that both levels led to increased retention of sight words. However, the high OTR condition resulted in effects that were twice as large as the moderate OTR condition. In this study, increased OTRs led to increased retention of newly learned sight words. The higher levels of OTR increased retention the most, showing that “opportunities to respond are critical to the development of fluent skill performance” (Burns, 2007, p. 259).

Child (2012) examined five of the most commonly used core reading program (CRP) lesson manuals to determine which, if any, of the seven elements of explicit instruction were recommended. She outlined the seven elements of explicit instruction as direct explanation, modeling, guided practice, independent practice, feedback, discussion, and monitoring. She looked at these elements across the five essential components of reading instruction outlined in the CRPs: phonemic awareness, phonics, fluency, vocabulary, and comprehension. Child found that three of the CRP publishers most commonly recommended guided practice, while the other two CRP publishers recommended direct explanation more than any other element. All five CRP publishers recommended feedback the least frequently. Child also discovered an overall decline in explicit elements recommended as the grades increased. Particularly, she noticed a drastic decline in guided practice recommendations beyond first grade. Grade 1 had the highest number of recommended elements of explicit instruction for the five reading essentials while grade 5 had the least. The CRP manuals more frequently suggested elements of explicit instruction to teach reading comprehension, followed by phonics. However, all seven elements of explicit instruction were present across the five components of reading instruction, showing the importance of explicit instruction in teaching every element of reading.

Direct instruction methods and strategies have increased in popularity among those teaching complex skills like reading. With accountability legislation like No Child Left Behind, American school systems are encouraged to “put pressure on reading achievement,” placing “effective approaches to instruction in immediate demand” (Watts, 2009, p. 23). A meta-analysis reviewed research on the achievement effects of comprehensive school reform and found that direct instruction was in the top three ($N = 29$) models reviewed for effectiveness; the researchers expect direct instruction to improve test scores across varying contexts, including urban and low-performing schools (Borman, Hewes, Overman, & Brown, 2003). Flynn et al. (2012) also found that direct instruction has effectively improved academic outcomes, especially for young, at-risk students. Rupley et al. (2009) agree that direct instruction “has been shown to be efficacious in learning and teaching the major components of the reading process - phonemic awareness, phonics, fluency, vocabulary, and comprehension” (pp. 125–126). Teachers can employ direct instruction methods to more effectively teach reading to both general education students and at-risk students.

Comparing direct instruction strategies and programs. A distinction should be made between direct instruction as a method of teaching and Direct Instruction (DI), a specific and highly scripted reading program. Direct Instruction programs typically include aspects of direct instruction teaching methodology. DI programs usually contain scripted lessons, with the new information in each lesson carefully controlled, and increasingly complex applications so that by the end of each lesson the students have mastered what has been taught (Stockard, 2010). DI programs undergo extensive field-testing before dissemination “to ensure that they produce the greatest learning in the most efficient manner” (Stockard, 2010, p. 220). Research has found DI

programs to be effective for various and diverse populations, including students with disabilities, minority students, and students from low-income backgrounds (Stockard, 2010).

The most widely used DI program is *Reading Mastery*, produced by SRA/McGraw-Hill. Reading Mastery uses “systematic, small steps” to develop reading strategies and skills (Ryder et al., 2006, p. 180). Students using *Reading Mastery* learn basic decoding and comprehension skills by advancing through several levels of the program (Ryder et al., 2006). *Reading Mastery* also teaches students to use strategies for tackling words they don’t know; teaching strategies helps students who can’t possibly memorize the definitions for every single vocabulary word (Marchand-Martella, 2006). Ryder et al. (2006) compared teachers using the *Reading Mastery* program, teachers using a mix of DI and non-DI, and teachers using the Houghton Mifflin basal reading series (non-DI). After following students from first through third grade, they found that *Reading Mastery* (DI) had more benefit for suburban than urban students in reading achievement and comprehension. Furthermore, teachers using DI often altered instruction to better fit their students’ needs rather than follow the exact *Reading Mastery* script. Teachers perceived DI to be limited as a sole reading program, but they saw it as a useful tool for building phonemic awareness and fluency skills (Ryder et al., 2006).

Open Court is a popular phonics-based and highly structured reading program based on explicit instruction principles. Stockard (2010) compared reading achievement among students exposed to the DI *Reading Mastery* curriculum and the *Open Court* program. Stockard found that students in the DI schools had significantly greater gains in reading achievement from first to fifth grade than students in the *Open Court* schools. These gains were significant, as the DI students had lower average vocabulary and comprehension scores than the other students when they started out in first grade. By fifth grade, those same DI students scored higher than the

other students and also scored above the national mean on both comprehension and vocabulary measures. However, this could just show that the DI program was more closely aligned with the measures used in the study. Stockard (2011) conducted another experiment comparing *Reading Mastery* to *Open Court*, but also examined how levels of technical support affected student achievement outcomes. Again, students in the DI condition scored significantly higher than students in the *Open Court* condition. Students experienced larger increases in achievement in schools with more technical support; specifically, when a purveyor associated with the development of *Reading Mastery* assisted at the school, students experienced more improvement. Stockard (2011) concluded that not only does DI benefit students more than *Open Court*, but also that better tech support leads programs to better implementation.

In another study, researchers used a highly structured and scripted DI program as a control condition (Snel, Terwel, Aarnoutse, & van Leeuwe, 2012). The experimental condition included classrooms taught by guided co-construction (GCC), a structured, cooperative learning approach. Teachers using GCC explicitly taught the whole class and also used scaffolding with individual students and small groups. The construction aspect “refers to the recognition and construction of symbols, words, sentences, and so forth by pupils on the basis of their prior knowledge and experiences” (Snel et al., 2012, p. 357). In other words, teachers using GCC help students by explicitly presenting aspects of reading while also taking contributions from students within meaningful contexts. Snel et al. (2012) found a significant interaction between condition and sociocultural backgrounds. The majority students scored better in the GCC experimental group while the minority students scored better in the DI control group. These findings suggest that while GCC can be an effective strategy for many students, DI appears to be more beneficial

for minority students. This may be due in part to the extremely different contexts, backgrounds, and prior knowledge of the minority students.

The School-wide Enrichment Model in Reading Framework (SEM-R) improves reading performance by enhancing student interest in reading. Rather than take a remedial approach to reading instruction, Reis and colleagues (2007) studied the use of SEM-R to enrich reading experiences and set higher learning standards. The SEM-R model exposes students to broad areas of interests like architecture or history, trains students in critical thinking and problem solving skills, and gives students opportunities to pursue self-selected topics of interest. In this way, SEM-R enhances student enjoyment of reading. Reis et al. (2007) found that after just 12 weeks, implementation of the SEM-R model improved reading fluency and attitudes about reading, although it had no significant effect on reading comprehension. Reis et al. concluded that SEM-R could act as a supplement to direct instructional reading programs to increase fluency and foster more positive attitudes toward reading.

Another method of explicit instruction utilizes the strategy of peer tutoring, involving student peers as one-on-one teachers to provide explicit and individualized instruction. Van Keer (2004) compared the effects of explicit, teacher-led instruction (STRAT) to the effects of explicit instruction involving the addition of peer tutors. Some fifth graders paired with second grade students to act as cross-age tutors (STRAT + CA) while other fifth graders paired with each other as same-age tutors (STRAT + SA). Compared to a control condition, all three explicit strategy conditions produced significantly higher gains in reading comprehension scores. Students profited most from the STRAT and STRAT + CA conditions. Interestingly, just the explicit instruction alone did not significantly differ from the explicit instruction with the addition of peer tutors, implying that explicit instruction in itself plays a key role in teaching

reading comprehension. Van Keer and Verhaeghe (2005) then conducted a very similar study comparing STRAT, STRAT + CA, STRAT + SA, and a control condition. Again, the STRAT and STRAT + CA showed the most significant effects for reading comprehension. In other words, second graders improved their reading comprehension scores when taught with explicit strategies or explicit strategies followed by tutoring from a fifth grader; poor readers made as much progress as high achievers. Although all experimental conditions resulted in significant gains, for fifth graders in the STRAT and STRAT + CA conditions, the significant effects lasted as long as six months. Clearly, not only explicit instruction, but also tutoring a younger peer can create long-lasting gains in reading comprehension.

Teacher perceptions of direct instruction. Because direct instruction strategies require a great amount of effort from the teachers, it is important to understand teachers' perceptions of using direct instruction in their classrooms. Collum (2012) conducted a qualitative study to better understand teachers' perceptions of teaching with direct instruction strategies. Collum hypothesized that teacher perceptions may have an impact on how ELLs receive direct instruction and ultimately that teachers' attitudes can impact student achievement. Collum interviewed 11 second grade teachers in Georgia using open-ended questions about direct instruction perceptions. Teachers said things like "Direct instruction is an effective strategy... It allows students to begin at their level" (p. 52), "There are no surprises" (p. 52), and "Direct instruction is very structured and eliminates a lot of the distractions" (p. 52). Seventy-three percent of the participants specifically mentioned direct instruction as a strategy to address varying levels of students within a single classroom. However, "36% reported that direct instruction is boring, and 27% stated that direct instruction moves too slowly and lacks creativity" (p. 52). Despite differing perspectives on direct instruction, 91% of the teachers

reported that it had benefited them by allowing them to use flexible grouping, monitor progress, and provide students with the necessary practice needed for success. Overall, teachers “felt that direct instruction was effective for struggling readers... They also felt it was the best method for addressing varying levels of students” (p. 76).

Ness (2011) studied the degree to which teachers incorporated explicit reading comprehension instruction strategies in their classrooms, and which strategies were the most and least frequently used. Although explicitly teaching reading strategies improves students’ comprehension, there is currently a lack of such instruction in elementary classrooms. Students may face negative consequences if not provided with explicit reading comprehension instruction (Ness, 2011). Twenty first- through fifth-grade teachers were observed for 120 minutes each. Ness found that explicit reading comprehension instruction made up 25% of language arts instruction. A previous study conducted by Durkin (1978-1979) found that only 1% of classroom instruction included explicit reading comprehension instruction, so Ness’s findings of 25% showed a significant increase. In fact, “reading comprehension instruction occurred more frequently than any other sort of instructional behavior or activity in these language arts classrooms” (p. 108). The highest amount of reading comprehension instruction occurred in fourth grade classrooms while the lowest amount occurred in third grade classrooms. Teachers most heavily favored asking questions as a comprehension strategy, followed by predicting or activating prior knowledge and summarization. The increase in time spent using reading comprehension instruction strategies from Durkin’s study shows that teachers more favorably view explicit instruction. This might be due to teachers taking advice from the vast amount of research calling for an increase in explicit instruction; it could also be due to an increase in professional development and instructional materials. However, it is unclear as to whether or not

this 25% is enough; would even more time spent using explicit reading comprehension instruction further benefit students?

While direct instruction is used to teach reading in general education classrooms, it is still an “uncommon special education instructional practice,” especially for students with moderate to severe developmental disabilities (Taylor, Ahlgrim-Delzell, & Flowers, 2010, p. 527). Taylor et al. (2010) interviewed six teachers of students with significant developmental disabilities (multiple disabilities, autism, and moderate cognitive disabilities) about using direct instruction to teach reading in their classrooms. All teachers reported that the explicit curriculum had an impact on student learning. Students improved in learning to read, engagement, and attention span and also experienced a positive impact on knowledge of concepts of print, phonics and phonemic awareness, word recognition, and reading comprehension. Teachers recounted 12 instances of “student challenges” as opposed to 51 instances of “student successes.” One teacher explained after using the intervention, “My students who, you know, people thought they wouldn’t be able to do something like this, that they would not be able to comprehend literacy in general. They are comprehending it, and they are able to pull what the story is all about, being able to take objects, or anything and relate them to the story that is being read” (Taylor et al., 2010, p. 534). Another teacher optimistically agreed, saying, “It’s exciting. I used to dread teaching reading, because it was, you know, flash cards, and trying to pull out whatever I could, constantly scrounging for more materials for the kids. Now it’s ready. I whip it out and I know we are all going to be successful” (Taylor et al., 2010, p. 537).

Most research on the use of direct instruction programs in special education classrooms centers on students with high incidence disabilities rather than significant cognitive impairments (Kanfush, 2010). Kanfush (2010) interviewed four teachers after they used the direct instruction

program *Reading Mastery* to teach reading to students with significant cognitive impairments. After the intervention, students showed significant improvement in the ability to decode words and also demonstrated significant gains on seven out of ten subtests on the Woodcock Reading Mastery Test- Revised. Teachers reported that they did not learn about direct instruction programs in their reading teaching methods classes at either undergraduate or graduate levels. Teachers had different ideas about the focus of *Reading Mastery*: some said its purpose was to make students feel successful while others thought it focused on auditory perception and listening skills. All teachers expressed satisfaction with the direct instruction method of teaching because they clearly saw students succeed while using the program. One teacher explained the strengths of *Reading Mastery* saying, “it’s repetitive, it’s scripted, [the students] know what’s coming next... from a planning point of view, it’s fabulous for a teacher” (Kanfush, 2010, p. 73).

Percy (2011) interviewed two junior high school ESL teachers from lower socioeconomic status (SES) schools that contained very high Hispanic populations. Percy (2011) asked the ESL teachers about reading instruction strategies and found that both teachers “engaged students in explicit reading strategies instruction” (p. 344). The teachers discussed how they would always start class with a learning goal, followed by explicitly teaching skills like main idea identification and use of context clues to determine the meaning of unknown words. One of the teachers mentioned how explicitly teaching these skills felt necessary, because the students would need those skills to go on to higher education.

Direct instruction for general readers. Many researchers examine the effects of direct or explicit instruction in teaching and improving reading skills. Andreassen and Braten (2010) investigated the effects of explicit reading comprehension instruction on Norwegian students’ reading motivation, comprehension, and strategy use. Compared to a control group using

ordinary teaching practices, the explicit instruction students used significantly more comprehension strategies and also significantly increased in reading comprehension measures. In a dissertation, Watts (2009) examined how explicit instruction of reading comprehension strategies affected third graders' reading achievement in terms of developmental level, reading fluency, and reading comprehension. Watts used scientific research-based strategies, like a focus on phonics and whole language, using a balanced approach, a focus on vocabulary, and a focus on comprehension, while defining explicit instruction as "precisely and clearly expressed information about reading comprehension strategies that the teacher explains to students" (p. 2). Using a pretest-posttest model with a single third grade classroom, Watts (2009) found that the treatment program of explicit instruction of research-based reading comprehension strategies successfully and significantly increased students' developmental reading levels, reading fluency levels, and reading comprehension scores. Effective explicit instruction strategies included comprehension monitoring, repeated reading, cooperative learning, graphic and semantic organizers, question answering, question generation, attention to story structure, and summarization of text. Clearly, explicit instruction using research-based reading comprehension strategies acts as an important factor in improving reading achievement.

Direct instruction for struggling readers. Direct or explicit instruction "is an essential feature of the kind of reading instructional programs struggling readers need to become better readers" (Rupley, 2009, p. 122). Struggling readers benefit from the interactive processes inherent in direct instruction; they learn to work and interact with their teachers to better comprehend written language. Direct reading instruction requires knowledge of several aspects of reading: phonemic awareness, phonics, fluency, and vocabulary. Struggling readers must

learn and understand these inseparable parts “with the end product always being reading comprehension” (Rupley, 2009, p. 120).

Ritchey (2011) outlined three principles of evidence-based instructional strategies for students with learning disabilities that positively affect reading achievement. First, reading instruction should be explicit, requiring “that the skills and strategies necessary for developing reading competence (phonological awareness, word recognition, fluency, vocabulary, comprehension) or for remediation of areas of weakness are taught directly to students” (p. 29). Modeling can effectively demonstrate the processes and steps used by skilled readers. Teachers should explicitly describe strategies, provide rationales for their use, and state how and when to implement them. Next, reading instruction must be intensive. Teachers can increase intensity by providing supplementary instruction in addition to core reading instruction or by increasing student-teacher interactions. Finally, reading instruction should be systematic with a delineated scope and sequence of instruction broken into smaller tasks and taught in a logical manner.

Older students with reading disabilities face risk for losing motivation related to reading because they can more easily tell when they have fallen behind their peers (Nelson & Manset-Williamson, 2006). Unfortunately, as they lose motivation, they also see an increase in more challenging curriculum. Furthermore, older students with learning disabilities are also more likely to perceive little personal responsibility for their lack of success. Nelson and Manset-Williamson (2006) studied 9- to 14-year old students with learning disabilities to see if an explicit, self-regulatory intervention could increase students’ reading self-efficacy, reading attributions, and positive affect for reading. While the explicit intervention group did not make significant gains in reading self-efficacy or attribution, they did significantly increase in positive affect for reading. The explicit comprehension group also made significantly larger gains in

their reading comprehension skills and more likely attributed reading failure to incorrect strategy use. Thus, explicit, self-regulatory strategy instruction can increase positive affect for reading and reading comprehension among students with learning disabilities and also help them identify incorrect strategy use.

Elliker (2009) hypothesized that reading success can be captured at the word level. By learning subwords, students can more likely understand the meaning of whole words. Elliker (2009) implemented an intervention in which third and fourth grade remedial reading students received explicit instruction on Greek and Latin prefixes, suffixes, and root words. Greek and Latin roots exist within many words in the English language; learning those roots may increase students' ability to decode the meaning of more complex vocabulary and ultimately become better readers. Elliker (2009) found a significant increase in vocabulary knowledge (pretest to posttest) and enthusiasm among students who received the explicit Greek and Latin root instruction. Students increased their desire to respond to vocabulary questions, to use specific strategies in the decoding of new words, and to transfer their knowledge to reading and writing in the classroom.

Some researchers believe that parents play a crucial role in children's positive reading outcomes. McConnell (2011) selected seven kindergarten students at-risk for reading difficulties. The students could not pronounce any letter sound and identified fewer than 10 letter names in less than one minute in the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) letter naming and letter sound identification subtests. McConnell (2011) then had the parents of those students complete 30 instructional lessons from *Teach Your Child to Read in 100 Easy Lessons* as an explicit instruction intervention. At baseline, none of the children read any words correctly. After the parent interventions, students experienced significant

improvements. After an introduction of letters and corresponding sounds, students began sounding out letters and reading words on the researcher's sentence list sheets. Students also steadily decreased in words read incorrectly; they improved in accuracy and use of decoding strategies. Ultimately the parent intervention taught students to work on connecting letters with sounds rather than relying on random guessing.

Students with learning disabilities often struggle in areas like science due to the discrepancy between their reading abilities and the difficult content of their classes (Seifert & Espin, 2012). Seifert and Espin (2012) studied students with learning disabilities in reading who were enrolled in a regular education biology class. Each student participated in four conditions: text reading, vocabulary learning, combined, and control. All conditions except for the control included explicit instruction for that area. Students read significantly more words in three minutes after the text reading and combined conditions. Students also made significantly more correct vocabulary matches after the vocabulary learning and combined conditions. In other words, the effects matched the intervention conditions: students exhibited better reading fluency when the intervention included text reading and better vocabulary knowledge when the intervention focused on vocabulary learning. Unfortunately, none of the interventions showed effects for reading comprehension.

Socioeconomic status often increases the gap in reading achievement between average and struggling readers (Pechous, 2012). Students from low-income households tend to perform significantly lower in reading than children from middle or high-income households. Some researchers refer to the loss of academic skills when schools are not in session as the "summer slide" (Pechous, 2012). Students have more access to opportunities and learning materials during the school year compared to a "lack of learning experiences during the summer months"

(Pechous, 2012, p. 2). Students from different socioeconomic backgrounds exhibit similar reading achievement during the school year, but those from disadvantaged backgrounds decrease in reading skills over the summer months. In one study, students who either identified with a learning disability in reading or performed below the twenty-fifth percentile of national norms in the area of fluency participated in a three-week summer intervention using the *Jump Start to Reading* direct instruction program (Pechous, 2012). Students who participated in the intervention experienced significantly less regression over the summer months than students who did not. In another study, seventh grade students performing two or more years behind in reading at an urban middle school participated in a six-week DI program intervention (Shippen et al., 2005). Regardless of the DI program used, students showed gains in word reading efficiency, reading rate, reading accuracy, and reading fluency. However, the DI programs appeared to be more effective and efficient for the stronger readers; the group with the higher performance at the beginning of the study improved more than the lower performing group.

Direct instruction for ELLs. Due to immigration, the United States has seen an increase in students learning English as a second language (ESL), also known as English language learners (ELLs) (Adesope, Lavin, Thompson, & Ungerleider, 2011). An increasing number of ELLs enroll in our country's schools who struggle with learning how to read in English (Swanson, Hodson, & Schommer-Aikins, 2005). ELLs experience difficulties as they enter mainstream, English-speaking classrooms where they face "increasing language and literacy demands in order to catch up with mainstream peers, all in a language that is unfamiliar to them" (Peercy, 2011, p. 325). It is understandable that so many ELLs struggle with learning to read and that many ELLs achieve at much lower levels than their English-speaking peers. Specifically, most ELLs experience difficulties with vocabulary, fluency, and comprehension

(Peercy, 2011). ELLs are also more likely to enter school without prior skills important to reading development like phonological awareness in English, which is an understanding of the sound structure of words (Rivas, 2012), and English vocabulary development. ELLs are more at risk for developing reading problems because many fall into lower SES demographics that influence prior knowledge and skill, many have impoverished language experiences at home, they may have a lack of resources (i.e., libraries, reading material, newspapers, etc.), their parents often have low English literacy levels leading to a lack of essential support, and they may have insufficient exposure to English outside of their schools and classrooms (Van Staden, 2011).

Because of the reading achievement gap between ELLs and their non-ELL peers, many researchers explore strategies that might decrease the gap and level the playing field. Adesope et al. (2011) explain that there is evidence for explicit, systematic phonics instruction and direct instruction in reading comprehension. Direct, explicit instruction forms the basis of effective strategies for teaching English literacy to ELLs.

Direct instruction reading interventions can significantly help ELLs improve their reading skills. In South Africa, most schools assess children in English even when they don't speak it, resulting in very low English literacy levels (Van Staden, 2011). Van Staden (2011) studied the effects of a direct instruction reading intervention with 4th-6th grade ESL students in South Africa. The intervention focused on sight-word recognition, vocabulary knowledge, word-decoding strategies, syntactic awareness, and reading comprehension. The children in the experimental intervention group improved significantly in all five areas. This significant improvement "clearly demonstrates the benefits of receiving direct/explicit instruction... in

important aspects of reading” (Van Staden, 2011, p. 18). This direct/explicit instruction intervention benefited ESL students after only six months.

Vocabulary development is one important area of reading achievement that can be explicitly taught. An expansive vocabulary positively correlates with reading comprehension skills and writing skills, contributing to one’s general language ability (Lee and Muncie, 2006). Many debate over the process of vocabulary acquisition; some believe that children acquire vocabulary simply by being exposed to new words while others argue that vocabulary must be explicitly taught to children (Magnusson & Graham, 2011). Minority students may need explicit, direct instruction of vocabulary to really increase and develop their vocabulary knowledge (Rivas, 2012). Magnusson and Graham (2011) compared ESL students who received explicit instruction of phrasal verbs to those who received exposure-only instruction. While some of the vocabulary words were clearly more difficult to master than others, Magnusson and Graham found a significant difference in treatment conditions. They concluded that while participants gained some knowledge through exposure only, they learned significantly more from explicit instruction. Rivas (2012) also studied the effects of explicit instruction of targeted vocabulary with mostly native Spanish-speaking students. Students in all but one of the intervention classrooms demonstrated significant vocabulary growth. Explicit instruction can improve ESL students’ vocabulary knowledge, which is a crucial aspect of reading achievement.

Cognitive and metacognitive reading strategies can also improve English reading comprehension. Aghaie and Zhang (2012) directly taught cognitive (i.e. “I read the text again to summarize its meaning”) and metacognitive (i.e. “I look for relationships between main ideas”) reading strategies to English as a foreign language (EFL) students in Iran. The teacher identified students’ current learning strategies, modeled new strategies, explained how the new strategies

could be used, and encouraged independent practice and strategy use. The explicit instruction treatment group performed better than the control group on the use of both cognitive and metacognitive strategies. Furthermore, the explicit instruction group performed significantly better from pretest to post-test, showing a significant improvement in reading scores. Carrell (1985) purported that an understanding of text structure could improve reading comprehension, especially for ESL students. After explicitly teaching ESL students about text structure, researchers saw a significant gain in post-test reading scores. The students also increased in the amount of information they could recall from the texts they read, including low-level, mid-level, and high-level ideas. Explicit instruction of cognitive and metacognitive reading strategies, like thinking about text structure, can result in significant gains in reading.

The Response to Intervention Approach

In recent years, educators have pushed for implementing a response to intervention (RTI) model to address the problem of an overrepresentation of ELLs in special education classrooms (Ybarra, 2012). The RTI model has been effective in schools with significant ELL populations and “existing literature supports RTI as an effective reading intervention and an alternative to Special Education” (Ybarra, 2012, p. 33). In the RTI model, students are assessed, monitored, and placed to ensure progress and effective instruction for their particular level.

The RTI model is defined as a three-tier model focused on “implementing increasing tiers of targeted instruction... based on student progress” (Kamps, et al., 2007, p. 155). The first tier encompasses primary instruction and general education for all students. Students who fail to reach academic benchmarks (based on assessments) move into the second tier. The second tier revolves around small-group interventions for students who have fallen behind. These targeted interventions give students the chance to improve and “catch up” to their peers. Educators

monitor the second-tier students more often, using benchmarks or mastery of specific skills to mark progress. If second-tier students fail to make progress, they move into the third tier. Tier three involves long-term, individualized instruction with frequent progress monitoring. The RTI model allows for movement between tiers as students progress and improve (Kamps et al., 2007). Direct, explicit reading instruction can form the basis of interventions at all three levels. Tier two reading interventions that involve the use of direct instruction methods have been found to be particularly effective when working with diverse populations, including ELLs.

Ybarra (2012) studied the effects of the RTI model as implemented in a Los Angeles K-8 school district with a 24% ELL population. Compared to their English-only counterparts, Ybarra (2012) found a significant relationship between ELL participation in RTI and reading achievement. After participating in the RTI model for five to six years, the ELLs consistently demonstrated a significantly higher rate of reading achievement. Although the English-only students ultimately earned higher reading scores in each grade level, the ELLs participating in RTI achieved at a faster and more consistent rate.

Swanson et al. (2005) examined a tri-level, special reading-related intervention model based on RTI at a largely bilingual, low SES junior high school in southern California. Students reading at a 6th grade level or higher were assigned to instruction emphasizing comprehension strategies. Students reading at or near 5th grade level were assigned to a reading intervention emphasizing comprehension strategies as well as an individualized computer program to improve reading skills and fluency. Students reading at or below a 4th grade level were further tested to determine phonological awareness and reading subskills. Those who scored low on such measures entered a small-group instruction class that emphasized phonological awareness and explicitly taught links between phonemes and graphemes when decoding and encoding

words. Students who participated in the phonologically based treatment program (small-group instruction) outperformed other students in analyzing the phonological construct of words, identifying words, decoding words, comprehending words, and understanding passages.

Kamps et al. (2007) hypothesized that students in RTI schools would demonstrate significantly more growth than comparison schools, that ELLs enrolled in direct instruction second-tier interventions would progress at a faster rate of growth than students in ESL interventions, and that those ELLs would perform at similar levels of early literacy skills as English-only students in interventions. Kamps et al. (2007) studied 318 elementary school students, including 170 ELLs (mostly native Spanish speakers). Experimental schools utilized secondary interventions with a direct instruction approach (teacher modeling, repeated practice to teach and reinforce new skills, and structured, sequenced, and scripted lessons). Overall, ELLs in the experimental schools, and specifically those participating in direct instruction interventions, experienced greater outcomes. Experimental school students performed significantly better than comparison school students. As hypothesized, within the interventions there were no significant differences between the ELLs and the English-only students. The ELLs in direct instruction intervention groups “scored higher at the start of second grade, reflecting gains from first grade for many students” (p. 163). Furthermore, 50-60% of the ELLs in direct instruction interventions were at benchmark or approaching benchmark by the end of first grade, compared to only 17% of the students enrolled in the ESL interventions.

In summary, secondary-level reading interventions can be highly effective for teaching literacy skills to ELLs. Studies have demonstrated how direct instruction interventions are highly effective with ELL groups, including Spanish-speaking students and students speaking other languages. Furthermore, ELLs benefit from these direct instruction interventions at similar

rates when compared to English-only students (Kamps et al., 2007). Ethnically and linguistically diverse students continue to be overrepresented in special education (Rhodes, Ochoa, & Ortiz, 2005). The National Research Counsel Committee on Minority Representation in Special Education (2002) recommended universal screening programs to provide effective interventions for at-risk students. Second tier interventions for ELLs at risk for reading problems can act as an effective solution for the problem of special education overrepresentation.

Historical Context of Interventions in the Study School

The elementary school involved in this analysis had previously used several reading interventions to aid at-risk and struggling readers. Prior to the 2013-2014 school year in which this analysis was conducted, the elementary school had been using a computer program called *i-Ready* (Curriculum Associates, 2012) for three years and a computer program called *Reading Plus* (Taylor Associates/Communications, Inc., 2014) for one year. The school district encouraged its schools to try out different programs to help struggling students and provided the school with these programs.

The principal of the school saw overall positive effects from these interventions. The two computer programs produced some good results. However, the principal felt that there was a need for a more rigorous intervention that could produce even more gains. The school is involved with the BYU-Public School Partnership, so the principal consulted with two professors from BYU to get ideas about a more effective reading intervention. One of the professors had worked as an ongoing consultant for the school for the past five years. The other professor had expertise in reading and academic interventions. The BYU professors suggested that the elementary school adapt the Exemplary Center for Reading Instruction (ECRI) method of teaching to be an additional intervention for the school's struggling readers (Reid, 1997). The

school willingly added this intervention to the other programs already in place (*i-Ready* and *Reading Plus*). None of these programs are specifically tailored for the ELL population.

The elementary school asked one of the BYU professors to train paraeducators in the ECRI method of teaching. The school also asked BYU personnel to aid with collecting data and observing the paraeducators to ensure that they implemented the ECRI intervention correctly. This study is an analysis of the data collected by the school with the help of BYU personnel.

Problem Statement

The problem for struggling readers is that once they fall behind, it only becomes more difficult for them to catch up to their peers. Socioeconomic status is one factor that increases the gap in reading achievement between average and struggling readers. Many ELLs experience difficulty learning to read in English because they struggle with fluency, vocabulary, and comprehension. These students may experience a combination of low SES and being unfamiliar with English in general, making it difficult for them to learn to read. Direct, explicit instruction is an effective strategy that decreases the gap in reading achievement between ELLs and their English-speaking peers. Specifically, second-tier, small group interventions that employ direct instruction strategies (including scripted, sequenced lessons, teacher modeling, and repeated practice) have demonstrated that they can be particularly effective in helping ELLs improve their English literacy skills.

Purpose of The Study

The purpose of this study is to analyze existing data collected by an elementary school that implemented second-tier, small group interventions to help struggling readers. During the 2013-2014 school year, the school implemented three different interventions: two computer-based interventions and a direct instruction intervention developed by ECRI. Because this

school has a large population of ELLs (mostly native Spanish-speakers), this study examined data from the ELL demographic involved in the interventions. Specifically, this study analyzed and compared the reading gains made by ELLs in the direct instruction ECRI intervention to ELLs in the computer-based interventions. This study also analyzed and compared the reading gains made by ELLs in the interventions to the gains made by non-ELLs in the interventions. The purpose of this study is to analyze the effects of the interventions and to determine whether any of the interventions produced more gains for the ELL population.

Research Questions

This study investigated two questions: (a) What are the reading gains for ELLs who participated in a small-group direct instruction intervention (ECRI) compared to gains for ELLs using a computer-based intervention? and (b) What are the reading gains for ELLs who participated in a small-group direct instruction intervention (ECRI) compared to gains for non-ELLs who participated in the same ECRI intervention?

CHAPTER 3

Method

Research Design

This study employed a mixed factors design using an experimental design for one factor and a causal-comparative design for the other factor. In other words, one variable is manipulated while the other variable is a fixed classification (Martella, Nelson, Morgan, & Marchand-Martella, 2013). This is an applicable method because one of the independent variables being studied is a manipulated, experimental variable while the other independent variable being studied is a pre-existing classification. For the experimental factor, students were randomly assigned to one of two treatment groups: a direct instruction reading intervention or one of two computer-based reading interventions depending on grade level. For the causal-comparative factor, students were classified according to English language ability as English language learner (ELL) or non-English language learner (non-ELL). This created a 2 X 2 factorial design: treatment group (direct instruction or computer-based) X English language classification (ELL or non-ELL).

Setting

The study was conducted at an elementary school of 506 students with a high ELL demographic in an urban area of central Utah. Fifty-nine percent of the students are an ethnic minority, 33% are ELLs, and 80% come from low-income families (Utah State Office of Education, 2012–2013).

Participants

Participants were 100 1st through 6th grade students. Because the school consists of primarily low-income families, the school has a high mobility rate of 14% (Utah State Office of

Education, 2012-2013). Throughout the course of the school year, 25% of the students participating in reading interventions moved away. The direct instruction intervention group (ECRI) lost more students than the computer-based intervention groups. At the end of the school year, participants were 75 1st through 6th grade students, including 47 males and 28 females, ranging in age from 6 to 12 years. Forty-five participants were randomly assigned to the direct instruction group (ECRI) and 30 students were randomly assigned to a computer-based intervention group.

Twenty-seven students were classified as English language learners, 17 students were previously classified as ELLs, and 31 students were non-ELLs. For the purpose of this study, the previously classified ELLs and non-ELLs were grouped together as non-ELLs. Students who were previously classified as ELLs reached a “proficient” level of oral English abilities, making them more similar to the non-ELLs than the current ELLs. Oral language proficiency is considered an important variable for reading development for both native and non-native English speakers (Kieffer, 2012). Conversely, low oral language skills influence average word reading and below average comprehension skills (Lesaux, Crosson, Kieffer, & Pierce, 2010). Lesaux et al. (2010) found that second language oral language skills had a large, significant effect on second language reading comprehension. Gottardo and Mueller (2009) and the National Literacy Panel for Language Minority Children and Youth (August & Shanahan, 2006) also found that English proficiency is one of the strongest predictors of English reading comprehension skills. This means that students who have achieved oral language proficiency in English experience a strong correlation with developing their English reading comprehension skills, making these students profoundly different from ELLs who have not developed oral English proficiency. Based on this research, the groups were separated so that one group

consisted of previously classified ELLs and non-ELLs, from now on referred to as non-ELLs. Non-ELLs were proficient in oral English ability and did not receive any ESL services, while ELLs were not proficient in oral English ability and received ESL services throughout this study. There were 15 ELLs and 30 non-ELLs in the direct instruction intervention and 12 ELLs and 18 non-ELLs in the computer-based interventions.

Table 1

Participant Numbers by ELL Classification for Intervention Groups, Gender, and Grade

	ELLs	Non-ELLs	Total
ECRI	15	30	45
<i>i-Ready</i>	10	11	21
<i>Reading Plus</i>	2	7	9
Males	19	28	47
Females	8	20	28
1st Grade	1	8	9
2nd Grade	7	4	11
3rd Grade	9	12	21
4th Grade	2	5	7
5th Grade	5	8	13
6th Grade	3	11	14

Table 2

Participant Numbers by Intervention Group for ELL Classification, Gender, and Grade

	ECRI	<i>i-Ready</i>	<i>Reading Plus</i>	Total
ELLs	15	10	2	27
Non-ELLs	30	11	7	48
Males	28	16	3	47
Females	17	5	6	28
1st Grade	5	4	0	9
2nd Grade	7	4	0	11
3rd Grade	7	13	1	21
4th Grade	6	0	1	7
5th Grade	7	0	6	13
6th Grade	13	0	1	14

At the end of the 2012-13 school year, each teacher in the school determined which of their students struggled with reading. Selected students showed difficulty in various aspects of reading, including the alphabetic principle, phonological awareness, vocabulary, fluency, comprehension, or some combination of those areas. Selection methods depended on grade level. Grades 1-3 used a combination of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) (Good & Kaminski, 2002) and the STAR Reading program (Renaissance Learning, Inc., 2012). Teachers selected students who consistently fell below grade appropriate benchmarks. Grades 4-6 used a combination of the STAR Reading program, and the SRA Reading Achievement Test (McGraw-Hill, 2012). Some teachers also looked at their students' previous year's Utah Criterion-Referenced Test (CRT) scores as well as which students were previously placed in interventions. One hundred of the identified students were then randomly assigned to one of the intervention groups. All participating students were selected before the school consulted with BYU personnel. Only students who demonstrated difficulties with reading were selected and randomly assigned to an intervention group. Group assignment was not based on ELL classification.

Instrument

The study analyzed student reading achievement data. The data included results from the Kaufman Test of Educational Achievement-II Brief Form (Kaufman & Kaufman, 2005). The KTEA-II Brief measures academic achievement in the composite areas of reading, mathematics, and written language. The Reading Composite analyzed in this study includes Letter and Word Recognition and Reading Comprehension subtests; these subtests measure vocabulary, phonics, and comprehension skills with these subtests. Internal consistency coefficients by age and grade are high, with the Reading Composite coefficient in the .90s. The other reading-related subtests

also have relatively high internal consistency coefficients ranging from .73 to .89; reliability coefficients of .70 or above are considered respectable (Martella et al., 2013). The overall Comprehensive Achievement Composite correlates about .8 with other measures of general cognitive ability and individual subtests and composites correlate with other achievement measures like the WIAT-II (Wechsler, 2001) and the Woodcock-Johnson III Tests of Achievement (Woodcock, McGrew, & Mather, 2001). These data indicate that the KTEA-II Brief is a valid and reliable measure of reading achievement.

The KTEA-II Brief was chosen as the main instrument for analyzing student data because students in all grades took this test at the beginning and end of the school year. Furthermore, it was the only instrument that did not also serve as a selection tool for determining which students were placed in interventions. The KTEA-II Brief was not specifically chosen to test the ELL population in the study. Traditionally, the Woodcock-Johnson III Tests of Achievement are used to test reading abilities of ELLs. However, the KTEA-II Brief was more readily available to the school and more efficient to administer. The Reading Composite of the KTEA-II Brief correlates .78 with the Woodcock-Johnson III Tests of Achievement Broad Reading Cluster and .89 with the Woodcock-Johnson III Tests of Achievement Basic Reading Skills Cluster. While the KTEA-Brief II may not be as in-depth as the Woodcock-Johnson III Tests of Achievement, it is considered a reliable substitute based on high reliability coefficients.

Procedures

Participants received their assigned interventions for 30 minutes daily, Monday through Thursday, for the 2013-2014 school year. These independent variables are described in detail below.

Direct instruction intervention. The direct instruction intervention used the Exemplary Center for Reading Instruction (ECRI) methods for teaching new words (Reid, 1996a; Reid, 1996b). The ECRI teacher uses scripted and memorized directives to teach new words, and employs critical teacher behaviors essential in preventing reading failure. These critical teacher behaviors include correctly modeling and prompting student responses, obtaining high rates of correct student responses during instruction, teaching for high levels of mastery (85-100%), maintaining on-task behavior, diagnosing students' errors, immediately re-teaching to correct errors, and providing ample guided and independent practice (Reid, 1997). ECRI is a vocabulary-based intervention that also builds fluency and comprehension skills as students read orally and place the target words in relevant sentences.

ECRI has a long history of effectiveness. Early research showed that ECRI teachers teach more in less time than comparable programs, check students' work more frequently, and praise more often (Wadham, 1972). Nine Title 1 schools in Granite District in Salt Lake City, Utah trained reading teachers using the ECRI methods and used reading materials provided by ECRI. Evaluations of these schools indicated that ECRI positively affected the schools both educationally and financially and that Granite District should consider district-wide implementation (Worldwide Education and Research Institute, 1967-1968). Teachers from four different districts in Utah were taught to use ECRI's teaching techniques during the 1971-1974 school years. Student achievement in all four districts was significant (Reid, 1973). Furthermore, students who started the program during their kindergarten year achieved higher than students who started the program during first- or second-grade. Ethnic origin, IQ, and sex played no role in determining expected achievement levels (Jordan, 1977). In studies conducted in 1990 and 1996, a combined 4260 students in 17 schools in several states were taught with

ECRI methods. After one year of instruction, regular education students in grades 4-6 averaged 2 years 3 months gains, and students in grades 7-12 averaged 2 years 5 months gains (Reid, 1997).

The ECRI method of teaching was developed and disseminated as a general classroom, school-wide, tier one model. For the purposes of this study, the ECRI method of teaching was adapted to target a small-group, tier two population of students who were at-risk for reading difficulties.

The ECRI methods teach new vocabulary based on the type of word. Teachers use the phonics method of instruction for phonetically regular words with two or fewer syllables if the students already know the letter names and sounds. Other words are taught by one of five word structure methods. Word Structure 1 is used when a word part is added without changing the base word (e.g., runs = run + s). Word Structure 2 is used for compound words (e.g., fireplace, ice cream). Word Structure 3 is used when a word part is added that changes the base word (e.g., babies = baby + s). Word Structure 4 is used for contractions (e.g., here's = here + is). Word Structure 5 is used for words with three or more syllables (e.g., adventure, equator). New words are taught by sight if they are phonetically irregular or adopted from foreign languages (e.g., the, was, isle, boudoir).

ECRI uses mastery learning with high criteria for mastery of individual skills. Teachers use the appropriate word structure method to teach each of the new words prior to students reading the story. The list of vocabulary words is called the mastery test. To pass a mastery test, students must read the words with 100% accuracy, one word per second, and spell each word with 100% accuracy.

Basal reading selections and mastery test vocabulary were taken from the *Reading Triumphs* series published by Macmillan/McGraw-Hill (2007), and the ECRI trainer provided the instructors with the necessary ECRI materials for teaching each word. Teaching materials were designed to help students learn to read, spell, use in a sentence, and discriminate each new word from a similar word, according to the word's structure.

Instructors introduced each new story by providing a copy of the mastery test to each student and teaching as many new words as possible during each session. When all new words had been taught, but not necessarily mastered, the students read the story a minimum of three times: orally, silently, and orally with expression. Meanwhile, the instructor used some session time during the week for students to practice reading, writing and spelling the new words or passing off their mastery tests individually with the instructor.

Instructor preparation. In preparation for the intervention, four paraeducator instructors received four hours of preparation and practice provided by an ECRI instructor. After one week of trial and practice teaching students, the ECRI trainer observed each of the teachers and provided formative feedback and coaching as needed over three teaching sessions for each instructor.

Treatment fidelity. Because the elementary school asked BYU personnel to ensure that the ECRI intervention was carried out correctly, undergraduate students were trained to conduct weekly written treatment fidelity observations of each instructor. The ECRI trainer provided observation forms and taught the observers by showing how the observation items matched the steps in ECRI. The trainer then completed 2-3 fidelity observations with each observer, compared results, and retrained the observers as needed to attain uniform accuracy. Treatment

fidelity observations continued throughout the school year, occurring in 35% of all ECRI sessions. The paraeducators administered the ECRI intervention with 96% fidelity, on average.

Computer-based intervention. Students in grades 1-3 used a computer program called *i-Ready* (Curriculum Associates, 2013). *i-Ready* is an online program designed to help struggling students who need remediation in areas of reading. The program begins with a diagnostic for grades K-12 that assesses students' skills across multiple grade levels. *i-Ready* uses an adaptive diagnostic that provides easier or harder questions based on previous student responses. This helps teachers identify areas of growth and areas of challenge for each student. Teachers can also see which students are above, at, and below grade level based on individual domains. Because the program adapts to students' abilities, *i-Ready* provides individualized and differentiated instruction. For children in lower grades, *i-Ready* instruction targets phonics, phonological awareness, and vocabulary skills. During the intervention times, students completed online lessons independently.

Students in grades 4-6 used a computer program called *Reading Plus* (Taylor Associates/Communications, Inc., 2014). *Reading Plus* aims to improve students' silent reading fluency, comprehension, and vocabulary by providing informational and literary selections with appropriate levels of vocabulary complexity, sentence length, and word count. As students demonstrate mastery, the selections include increased levels of academic vocabulary, word counts, and deeper, more complex topics. Similar to *i-Ready*, *Reading Plus* is designed to adjust the content difficulty so that students complete activities corresponding to their reading levels. *Reading Plus* is designed to develop and build vocabulary, fluency, and comprehension skills. The Institute of Education Sciences (2010) conducted a What Works Clearinghouse Intervention

Report regarding the program and found that *Reading Plus* had potentially positive effects on comprehension. During the intervention times, students completed online lessons independently.

Data Analysis

This study used two 2 X 2 mixed factors designs, one for ECRI and *i-Ready*, and one for ECRI and *Reading Plus*. The data were analyzed using a 2 X 2 repeated measures analysis of variance (ANOVA; Martella et al., 2013). Students' post-test Normal Curve Equivalent (NCE) scores on the Reading Composite of the KTEA-II Brief were compared to their pre-test NCE scores on the Reading Composite of the KTEA-II Brief. NCEs are standard scores, generally used for reporting results of student performance to the federal government (Kaufman & Kaufman, 2005). NCE scores have a normalized scale with equal intervals, so they are preferable to percentile ranks for computing statistics (Kaufman & Kaufman, 2005). Scores were compared between groups (experimental and causal-comparative). Repeated measures ANOVAs were used to compare ELLs in ECRI to ELLs in the computer interventions and to compare ELLs in ECRI to non-ELLs in ECRI. Independent *t*-tests were also used to analyze differences between groups at pre-test and post-test.

CHAPTER 4

Results

Grades 1-3

The repeated measures ANOVA indicated a main effect for time ($F = 13.504, p = .001$) and interaction effects for intervention ($F = 4.894, p < .05$) and ELL classification ($F = 5.704, p < .05$).

An independent t -test was computed to determine the differences between the intervention groups on pre- and post-test NCE scores. No significant difference was found between ECRI and *i-Ready* on pre-test NCE scores ($t = -1.137, p = 2.64$), but a significant difference was found on post-test NCE scores ($t = -3.052, p = .005$).

The first study question is what are the reading gains for ELLs who participated in a small-group direct instruction intervention compared to gains for ELLs using a computer-based intervention?

A repeated measures ANOVA compared ELLs in ECRI ($n = 7$) to ELLs in *i-Ready* ($n = 8$) on pre- and post-test NCE scores. No main effect for time was found ($F = 2.002, p = .181$). Intervention assignment was not a significant factor ($F = 2.348, p = .149$). An independent t -test showed no significant difference between ELLs in ECRI and ELLs in *i-Ready* on pre-test NCE scores ($t = .236, p = .817$) or post-test NCE scores ($t = -.786, p = .446$). Mean NCE scores showed that ELLs in *i-Ready* scored lower on post-test ($M = 33.500$) than pre-test ($M = 33.750$) while ELLs in ECRI showed improvement from pre- ($M = 32.429$) to post-test ($M = 38.714$).

Key:
i-Ready: black line
 ECRI: dotted line

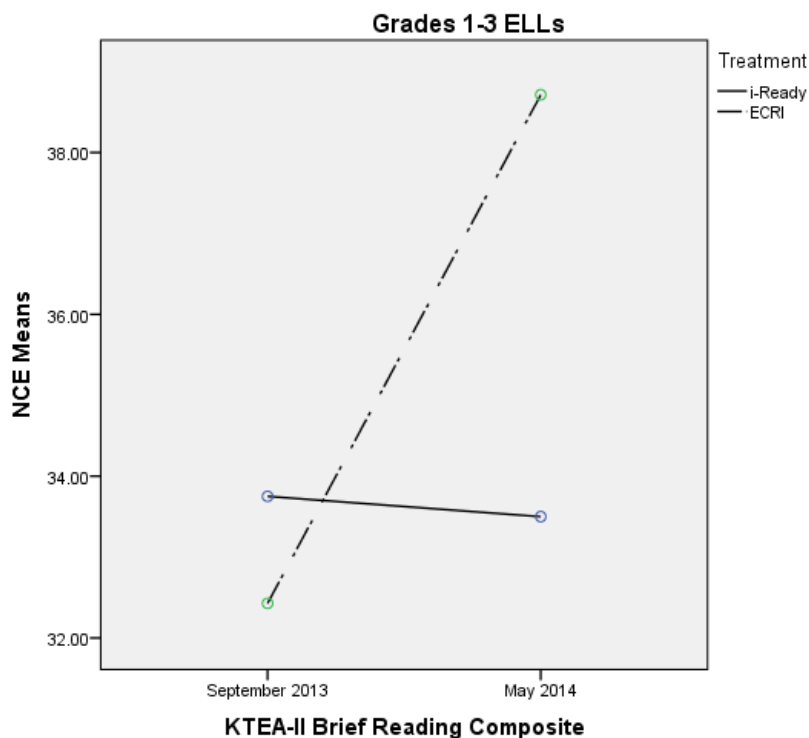


Figure 1. ELLs in the ECRI intervention compared to ELLs in the *i-Ready* intervention in grades 1-3.

The second study question is what are the reading gains for ELLs who participated in a small-group direct instruction intervention compared to gains for non-ELLs who participated in the same intervention?

A repeated measures ANOVA compared ELLs in ECRI ($n = 7$) to non-ELLs in ECRI ($n = 9$) on pre- and post-test NCE scores. The test indicated a main effect for time ($F = 12.377, p = .003$). ELL classification was not a significant factor ($F = 3.674, p = .076$). Students in the ECRI intervention significantly improved pre- to post-test, regardless of ELL classification. An independent t -test revealed no significant difference between ELLs in ECRI and non-ELLs in

ECRI on pre-test NCE scores ($t = .306, p = .764$). On post-test NCE scores, a t -test still showed no significant difference between ELLs and non-ELLs ($t = 1.951, p = .071$), although the difference appeared to be approaching significance. Non-ELLs ($M = 55.778$) performed much better than ELLs ($M = 38.714$) on the post-test, indicating that non-ELLs in ECRI made more gains than ELLs in ECRI.

Key:
 Non-ELLs: black line
 ELLs: dotted line

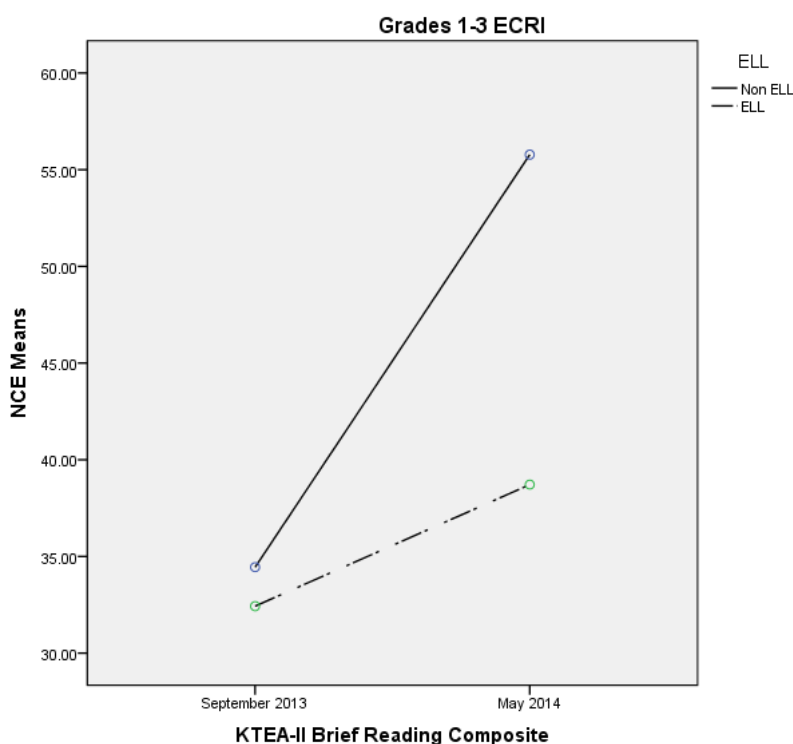


Figure 2. ELLs in the ECRI intervention compared to non-ELLs in the ECRI intervention in grades 1-3.

Grades 4-6

A 2 X 2 repeated measures ANOVA analyzed the effects of intervention (ECRI vs. *Reading Plus*) and ELL classification (ELL vs. non-ELL) on pre-test to post-test NCE scores. It

showed a significant main effect for time ($F = 12.396, p = .002$). Intervention ($F = .288, p = .596$) and ELL classification ($F = 1.709, p = .203$) were not significant factors.

An independent t -test compared the differences in NCE scores between ECRI and *Reading Plus* interventions at pre- and post-test. No significant difference was found between intervention groups at pre-test ($t = .063, p = .950$) or post-test ($t = -.663, p = .512$).

Regarding the first study question, a repeated measures ANOVA evaluated the differences between ELLs in ECRI ($n = 7$) and ELLs in *Reading Plus* ($n = 3$) on pre- and post-test NCE scores. It revealed a significant main effect for time ($F = 7.155, p = .028$). Intervention group was not a significant factor ($F = .002, p = .969$). An independent t -test found no significant differences between ELLs in ECRI and ELLs in *Reading Plus* on pre-test NCE scores ($t = -.498, p = .632$) or post-test NCE scores ($t = -.291, p = .779$).

Key:
Reading Plus: black line
 ECRI: dotted line

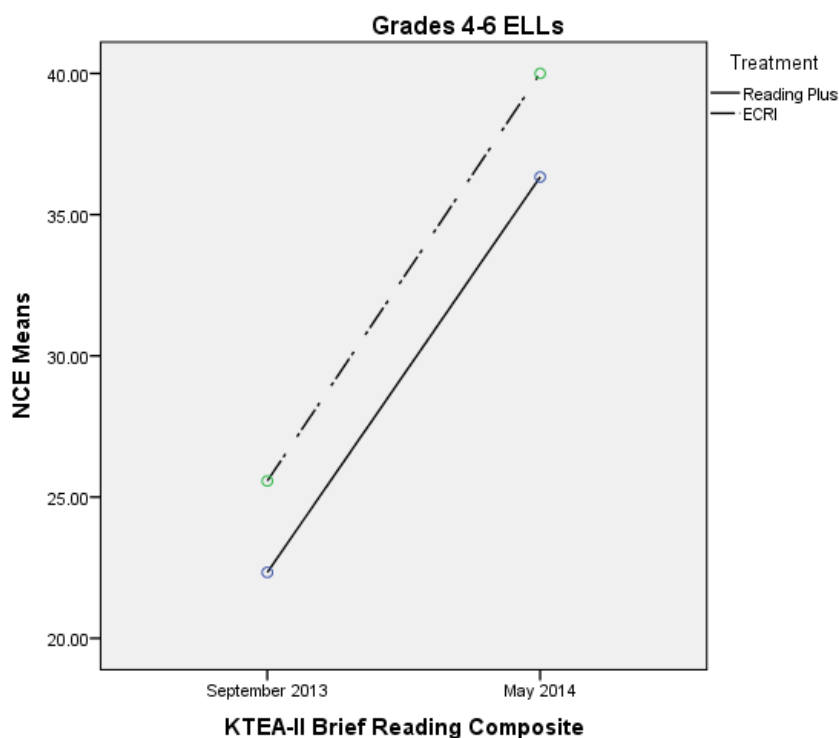


Figure 3. ELLs in the ECRI intervention compared to ELLs in the *Reading Plus* intervention in grades 4-6.

Regarding the second study question, a repeated measures ANOVA compared gains made by ELLs in ECRI ($n = 7$) to non-ELLs in ECRI ($n = 13$) and found a significant main effect for time ($F = .472, p = .028$); ELL classification was not a significant factor ($F = .002, p = .969$). An independent t -test found a significant difference in NCE scores between ELLs in ECRI and non-ELLs in ECRI on the pre-test ($t = 2.394, p = .028$). By post-test, there was no significant difference in NCE scores between ELLs and non-ELLs in ECRI ($t = .904, p = .377$).

ELLs in ECRI made greater gains from pre-test ($M = 25.571$) to post-test ($M = 40.000$) than non-ELLs ($M = 38.692$; $M = 47.786$).

Key:
 Non-ELLs: black line
 ELLs: dotted line

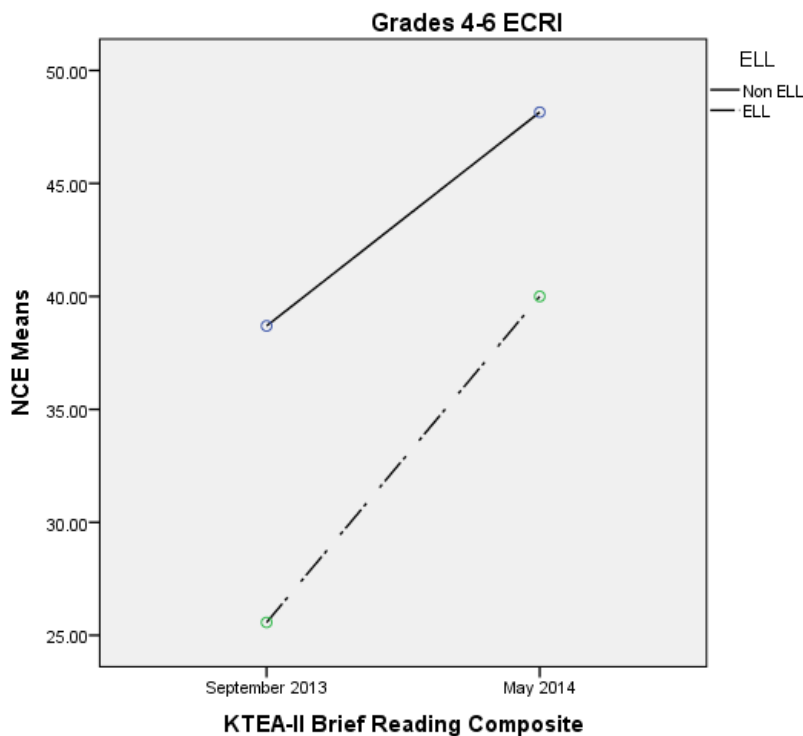


Figure 4. ELLs in the ECRI intervention compared to non-ELLs in the ECRI intervention in grades 4-6.

CHAPTER 5

Discussion

The study investigated two questions: (a) What are the reading gains for ELLs who participated in a small-group direct instruction intervention compared to gains for ELLs using a computer-based intervention? and (b) What are the reading gains for ELLs who participated in a small-group direct instruction intervention compared to gains for non-ELLs who participated in the same intervention?

In grades 1-3, all students significantly improved from the pre-test KTEA-II Brief to the post-test KTEA-II Brief. Non-ELLs improved significantly more than ELLs and students in ECRI improved significantly more than students in the *i-Ready* intervention. All students in grades 4-6 significantly improved from pre-test to post-test. There were no significant differences between students in ECRI and students in *Reading Plus* in grades 4-6.

Research Question 1: What are the reading gains for ELLs who participated in a small-group direct instruction intervention compared to gains for ELLs using a computer-based intervention?

In grades 1-3, although there were no significant differences between ELLs in ECRI and ELLs in *i-Ready*, ELLs in ECRI made gains from pre-test to post-test while ELLs in *i-Ready* made no gains and actually scored lower on average on the post-test. In grades 4-6, ELLs in both ECRI and *Reading Plus* significantly improved from pre-test to post-test. ELLs in ECRI and ELLs in *Reading Plus* made comparable gains over the course of the school year.

Research Question 2: What are the reading gains for ELLs who participated in a small-group direct instruction intervention compared to gains for non-ELLs who participated in the same intervention?

In grades 1-3, students in the ECRI intervention significantly improved from pre- to post-test. There were no significant differences between ELLs in ECRI and non-ELLs in ECRI, as all students made gains. However, non-ELLs in ECRI made greater gains than ELLs in ECRI. In grades 4-6, students in the ECRI intervention significantly improved from pre- to post-test. At the pre-test, there was a significant difference between ELLs in ECRI and non-ELLs in ECRI. By post-test, this difference was no longer significant. It can be concluded that the achievement gap between ELLs and non-ELLs in ECRI narrowed in grades 4-6.

Discussion of Findings

In all grades, students who participated in the ECRI intervention significantly improved from pre-test to post-test. This confirms the research presented by the National Reading Panel (2000) that direct, explicit instruction is the most effective method to teach reading skills. It also aligns with research that proposes direct, explicit instruction is a necessary feature of the type of reading instruction struggling readers need to improve in the five critical areas of reading: phonemic awareness, phonics, fluency, vocabulary, and comprehension (Rupley, 2009). The National Reading Panel (2000) concluded that children who received systematic and explicit phonics instruction make greater reading gains. ECRI is a type of phonics instruction because “in phonics the clues to identifying the word lie *within* the word itself, and children are encouraged to attend to the finer points of the word structure” (Shaywitz, 2003, p. 237). ECRI instruction takes place in small groups, lending to more individualized attention. Reading researchers agree that basic reading skills “are best addressed in smaller groups” because of the “variability in reading skills within a class” (Shaywitz, 2003, p. 245). ECRI involves high rates of opportunities to respond, which is a strategy that increases skill fluency, correct responses, and overall academic performance (Burns, 2007; Haydon et al., 2012; Simonsen et al., 2010).

Furthermore, ECRI employs the use of an active teacher who models and provides feedback and guidance. This aligns with the research that listed modeling as an important and effective aspect of reading instruction (Regan & Berkeley, 2012; Rupley et al., 2009; Shippen et al., 2005). The National Reading Panel (2000) emphasized the importance of teacher feedback and guidance for reading instruction to produce the strongest results.

This study gives further insight on computer-based interventions used to teach or improve reading skills. The National Reading Panel (2000) reported that the sample of experimental research about computer instruction was too small to draw specific conclusions. While studies show that computers can act as useful practice tools for reading, it is unclear whether or not computers can act as effective teachers (Shaywitz, 2003). In one study, computers taught comprehension strategies to children with reading disabilities. The researchers found that the children did not apply the strategies they had been taught when seated alone at the computer and that computers were not necessarily substitutes for a good teacher (Wise, King, & Olson, 1999). In this study, the *Reading Plus* program yielded outcomes comparable to the ECRI direct instruction intervention for all students in grades 4-6, including ELLs. The *i-Ready* program used in younger grades did not yield comparable outcomes; children in the *i-Ready* program made fewer gains and ELLs actually scored lower on the post-test on average. This difference may be due to the difference in reading instruction between younger grades and older grades. Younger grades focus on reading skills like phonological awareness and the alphabetic principle while older grades tend to focus on building vocabulary, fluency, and comprehension. Perhaps computer programs like the ones used in this study are less effective in teaching the basic reading skills like phonics that act as building blocks for higher-order reading skills. This supports the National Research Panel's (2000) finding that phonics instruction should be taught explicitly as

well as the idea that phonics instruction should be “active, with many teacher-child interactions” (Shaywitz, 2003, p. 245). The age of students participating in the interventions may have also acted as a factor; older children might be more attentive to computers than younger children, making the computer-based intervention more effective in the upper grades. Furthermore, younger children may not have as much experience typing. Wijekumar et al. (2012) studied the effects of a computer program designed to teach reading skills and found that the students’ ability to type often affected the results of the tests. Overall, more research is needed to determine whether computer programs can act as replacements for direct, teacher-led instruction or if these programs function more effectively as supplements to instruction.

This study highlights the effectiveness of tier two interventions for students struggling in academic areas like reading. The RTI model benefited students in this study because universal screenings identified students having difficulty, and those students were then placed in interventions to work on and build their lagging skills. These findings confirm the recommendation made by the National Research Counsel Committee on Minority Representation in Special Education (2002) to use universal screening programs to provide effective interventions for at-risk students. This model shifts the focus away from special education referrals by taking a preventative approach. Over-identification of students requiring special education services can be dangerous, as research shows that “special education programs tend to stabilize the degree of reading failure rather than close the gap between a dyslexic student and his classmates” (Shaywitz, 2003, p. 322). In one study, students’ reading skills were tested before and after receiving special education services in a resource room for three years. No changes in word reading scores were found and students showed a significant decline in their performance on reading comprehension measures (McKinney, 1989). In this study, the

interventions based on the RTI model indicated that they could act as an effective alternative to special education, as students participating in the interventions significantly improved from pre-test to post-test. At a school with a high population of ELLs, these are important findings that address the problem of the overrepresentation of ELLs receiving special education services (Rhodes et al., 2005; Ybarra, 2012).

All ELLs who participated in the direct instruction ECRI intervention improved from pre-test to post-test, and the ELLs in upper grades significantly improved. It is logical that the non-ELLs in the lower grades made greater gains because these students were already proficient in oral English language ability, which is a predictor of English reading skills (Kieffer, 2012; Gottardo & Mueller, 2009; Leseaux et al., 2010). However, while the non-ELLs in lower grades made greater gains, the ELLs in those grades still improved from the beginning to the end of the school year. In the upper grades, the ELLs in ECRI started to close the gap. At the beginning of the year there was a significant difference between non-ELLs and ELLs, but by the end of the year this difference was no longer significant. The ELLs in ECRI made great gains, confirming the research that direct instruction interventions are highly effective with ELL groups (Kamps et al., 2007). Similar to the study conducted by Kamps et al. (2007), the ELLs benefited from the same direct instruction intervention found to be successful with non-ELLs. This study supports the research that direct, explicit, systematic instruction in areas of phonics can yield reading gains for ELLs (Swanson et al., 2005). The study also shows the importance of ELL participation in an RTI-based reading intervention. Similar to other studies, ELLs made improvements in their reading achievement; in the upper grades this achievement occurred at a higher rate than that of their non-ELL peers (Kamps et al., 2007; Ybarra, 2012).

Limitations

The major limitation of this study is the small sample size in each of the groups. For greater confidence in the significance of results, statistical analysis typically requires sample sizes of at least 30 individuals. The intervention and classification groups being compared in this study each had fewer than 30 students. Because this study occurred in the context of the BYU-Public School Partnership collaboration, certain factors like sample size could not be controlled. For example, the school insisted on using several different interventions to determine which reading intervention produced the most effective results. The school had already been using *i-Ready* for three years; they added the *Reading Plus* intervention the year before to see if it would work better for the upper grades (the *Reading Plus* program is only designed for students at or above a third grade reading level). Because these are two distinct programs, the analysis had to tease apart lower and upper grades. This decreased the sample sizes for all intervention groups. Rather than comparing all students participating in ECRI to all students using one computer program, the analysis had to compare ECRI to *i-Ready* in the lower grades and ECRI to *Reading Plus* in the upper grades. This also led to a smaller sample size of ELLs and non-ELLs in each of the intervention groups. Furthermore, ELL classification is a naturally occurring variable (i.e. students can not be assigned to the ELL or non-ELL groups) that could not be controlled, despite the small sample sizes in each intervention group. Additionally, this study took place at a Title I school with a high mobility rate, which is common in lower socioeconomic status areas. Twenty-five percent of the students originally assigned to an intervention moved out of the school during the course of the study. While the small sample sizes are regrettable in regards to statistical analysis, this is the nature of conducting research in a school environment.

The selection methods used to identify struggling readers at the school could be considered a limitation. The selection methods varied by grade and teacher; they also involved the use of several different measures including DIBELS, the STAR reading program, the SRA Reading Achievement Test, and the previous year's CRT scores. Selection and identification of students with reading difficulties was often subjective, based on the teachers' perceptions of which students needed the most help. The study would have been more rigorous if all teachers had used the same, objective measures to identify students who could benefit from reading interventions.

A smaller limitation in this study was the use of the KTEA-II Brief as a measurement tool. This assessment was chosen because it was readily available to the school and did not require extra resources. The KTEA-II Brief was also chosen because it was a separate measure that was not used as an identification tool to place students in the study. Additionally, the Brief edition allowed for ease and speed of assessment so that students did not spend too much of their valuable educational time in testing. However, the Brief edition only contains two reading subtests and one overall reading achievement score. A greater depth of information could have been gleaned by using the Woodcock-Johnson III Tests of Achievement as the pre- and post-test measure. The Woodcock-Johnson III contains a wider variety of reading-related subtests that narrow in on specific reading skills such as phonological awareness, vocabulary, fluency, and comprehension. In contrast, the KTEA-II Brief only measures vocabulary and comprehension. Nonetheless, the KTEA-II Brief is considered a valid and reliable measure that correlates with the more popular and widely used Woodcock-Johnson III at acceptable levels (.78 with the Broad Reading Cluster and .89 with the Basic Reading Skills Cluster).

Implications for Future Practice and Research

This study originated because a local public school consulted with professors and graduate students at Brigham Young University about effective reading programs for their students. Because of the BYU-Public School Partnership, the first step is to present the results of the different interventions from the 2013-2014 school year. Based on the results of this study, it is strongly recommended that the school continue to use ECRI as a reading intervention for struggling readers. Students from all grades and ELL classifications significantly improved over the course of the school year when they participated in the ECRI intervention. It is also recommended that the school continue using the *Reading Plus* program; this intervention produced comparable results to ECRI in upper grades, especially for the ELLs. The school should consider placing all at-risk or struggling students in the lower grades in ECRI. The *i-Ready* program did produce some gains, but most of these gains occurred only in the non-ELLs. The most effective reading programs help students improve regardless of ELL classification, as seen in ECRI. The school also might consider implementing an additional direct instruction program; it would be interesting to examine how ECRI compares to other direct instruction programs.

Based on these recommendations, the school should continue implementing reading interventions at the tier two level for at-risk students. Students may increasingly improve their reading skills as they participate in interventions for multiple years. Some studies show that reading programs become more effective as they are implemented over several years (Pechous, 2012; Ybarra, 2012). Continued implementation will also combat the “summer slide,” or the loss of academic skills when schools are not in session (Pechous, 2012). The summer slide phenomenon is particularly pertinent in low socioeconomic status areas because research shows

that students from various economic backgrounds may be at similar levels during the school year, but during the summer students from disadvantaged backgrounds experience a steeper decline in academic skills that leads to increased learning gaps between children from low-income and children middle/high-income homes (Pechous, 2012). Because this school has a high rate of students from low-income backgrounds, the administrators should continue implementing interventions to ensure that all students have the opportunity to achieve at expected levels.

If the school continues using computer-based reading programs, including *Reading Plus* for the upper grades, continued implementation will provide further data about the efficacy of computer programs used to teach reading skills. The National Reading Panel (2000) reported a lack of current research to make conclusions about the ability of computer-based programs to teach reading. In another study, children with reading disabilities received part of their reading instruction from individualized computer programs. Students made gains, but these gains were not maintained when the children were tested the next year or two years later (Olsen, Wise, Ring, & Johnson, 1997). There is a possibility that the gains made by students in *i-Ready* and *Reading Plus* will not be maintained. Continued implementation will build up the research on computer-based reading interventions.

Conclusion

This study confirmed previous research that direct, explicit instruction benefits students struggling with reading difficulties. The study also builds on research about computer-based reading programs. Second-tier interventions for at-risk and struggling readers were shown to be effective and to produce reading gains. Students who participate in these interventions, including ELLs, can make significant reading gains. Participation in second-tier reading

interventions gives ELLs the opportunity to close the gap that exists between ELLs and non-ELLs, while also helping all students significantly improve their reading skills.

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