THE LEXIA PROGRAM AND READING SCORES WITHIN THE INTERVENTION CLASSROOM

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The Lexia Program and Reading Scores within the Intervention Classroom

A Field Study Report

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Education Specialist

Kelly Brown

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To the College of Graduate Studies:

We are submitting a field study report written by Kelly Brown entitled "The Lexia Program and Reading Scores within the Intervention Classroom". We have examined the final copy of this field study report for form and content. We recommend that it be accepted in partial fulfillment of the requirements for the degree of Education Specialist.

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ABSTRACT

KELLY D. BROWN. The Lexia Program and Reading Scores within the Intervention Classroom (Under the direction of DR. BENITA BRUSTER.)

Purpose: The purpose of this study was to determine if a relationship exists between the amount of time engaged with the LexiaCore 5 program and the students' reading scores.

Methods: This correlational study used archived data collected from a rural elementary school located in Middle Tennessee. The data was compiled from reading assessments taken by students who were actively engaged with the LexiaCore 5 program while in an intervention classroom.

Results: The results of this study indicated that, as a school, a weak relationship existed between the study variables. The Pearson correlation coefficient was found to be $r = -0.24$. However, results reported by grade level indicated a strong negative relationship between the study variables for first grade with a $r = -0.58$ and fifth grade with a $r = -0.42$. Results indicated no relationship between study variables for second grade, $r = -0.01$, and third grade, $r = 0.01$. All students engaged with the Lexia program made gains in their reading scale scores.

Conclusions: The results of this study indicated an increase in the amount of engagement time does not relate to an increase in reading scale scores.

Additional Research: Further research is needed to determine if there is an optimal amount of engagement time for each student to spend on the LexiaCore 5 program. This will allow teachers to use computer-assisted instruction (CAI) programs such as the LexiaCore 5 program more effectively.

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CHAPTER I

Introduction

Classroom teachers across the state of Tennessee face a daunting task of implementing the new state-mandated instructional model, Response to Instruction and Intervention (RTI²). This new framework model for instruction provides educators with new guidelines for evaluating and identifying specific learning disabilities. According to the Tennessee Department of Education (2015), "This change in current standards from one of a discrepancy model of identification to a Response to Intervention (RTI) model becomes effective July 1, 2014" (p. 7). This new instructional model is designed to target students who score below the 25th percentile on a state approved screening assessment tool, such as the Standardized Test for the Assessment of Reading (STAR) tests. The STAR reading and STAR early literacy tests are two assessment tools used as universal screeners in the state of Tennessee. The Tennessee Department of Education (2015) defines a universal screener as "a brief screening assessment of academic skills (i.e. basic reading skills, reading fluency, reading comprehension, math calculation, math problem solving, written expression) administered to all students" (p. 80). This screening measure allows educators to determine which students are performing below grade level. Students who scored below the 25th percentile were placed within a tiered model of remediation and intervention.

The RTI model of instruction consists of three tiers, or levels, of instruction and intervention. There are three tiers of instruction within the RTI model. Tier I instruction is known as the core instruction. All students regardless of academic ability receive the Tier I instruction, and is completed within the regular education classroom. This level of instruction should meet the needs of 80-85 percent of the students. "Tier I is the first layer of prevention

and it should be the focus of instruction, providing a strong foundation, and striving to meet the needs of all students" (Tennessee Department of Education, 2015, p. 24).

The next level of instruction within the RTI model is Tier II. This level is designed to provide reading and math interventions to the students who tested below the 25th percentile on the school's universal screener. About 10 to 15 percent of students will need this supplemental instruction in order to master grade level skills. According to the Tennessee Department of Education (2015), "Tier II intervention is explicit and systematic. Tier II requires high-quality intervention matched to students' needs and provided by highly-trained personnel" (p. 35). The last level of instruction is known as Tier III. This level should provide services to about three to five percent of the student population. This instruction is provided to students who fail to make gains within Tier II instruction. This instruction is more intense than the instruction provided in Tier II. Students may qualify for Tier III instruction if they are two years behind or they score below the 10th percentile on the universal screener (Tennessee Department of Education, 2015).

Educators focus on the skills identified as needing remediation based upon the results of the universal screener. Intervention activities are designed to address these skill deficits. Robins and Antrim (2013) described the goal of the RTI model, "The goal of RTI is to provide personalized, just-in-time intervention in reading and math for students who are in danger of falling behind their peers" (p. 45). This new instructional model began during the 2014-2015 school year. Program administrators estimated that a period of at least five years would be necessary for a complete implementation and integration of the RTI program (Robins & Antrim, 2013).

In today's age of advancing technology, many school districts are beginning to use computer-assisted instruction (CAI) as a tool to help differentiate the instruction in the intervention classroom. According to Regan, Berkeley, Hughes, and Kirby (2013), "Differentiated instruction is a model intended to meet the widely diverse needs and ability levels of students in inclusive classrooms through flexible use of time, space, materials, and strategies" (p. 106-107). Computer based software and educational websites can be used as resources and teaching tools when providing instruction that is differentiated to a diverse group of students.

Chambers (2008) listed three significant ways in which technology and software programs can be used within the RTI model successfully. The first way was to include technology that incorporates multimedia techniques. The second way to encourage success within the program was to assess year-round. Intervention teachers assessed frequently in an effort to ensure that the intervention was working and that students were progressing and showing academic growth. If they are not, the intervention needed to be changed as soon as possible. The third way to achieve success within the RTI model consisted of using data effectively. Teachers desegregated the data after each assessment and determined where changes needed to be made within the intervention program (Chambers, 2008). The Lexia Learning System is listed as one of the intervention programs that meet all three of these suggestions.

The intent of this study was to determine the effectiveness of computer-assisted instructional reading interventions. The need for quality reading education interventions was apparent when desegregating the data received from the STAR assessments. Students who scored below the 25th percentile needed intervention activities and lessons in order to master

grade level activities and assessments. The problem focused on within this study addressed an increase in the percentage of students who were reading below grade level.

In an effort to aid teachers with this task, school districts began to turn to programs such as the LexiaCore 5 reading program. This program is an example of a CAI program that helps teachers manage classroom instructional time by providing them with a tool for individualized differentiated instruction. In a recent study by McMurray (2013), the researcher examined the Lexia program, of which the LexiaCore 5 is a component. The researcher found that "when standardized reading scores for the intervention and control groups were compared, the intervention group made significantly greater progress in reading than the control group" (p. 15). In this particular study, the intervention group utilized the Lexia reading program and the control group did not. McMurray (2013) described as the Lexia reading program in the following statement:

> Lexia Reading software is a web-based reading intervention designed to enhance reading through a phonics-based approach. The software automatically adapts to accommodate the needs of the individual learner providing learning at a pace that allows the child to participate in activities until mastery of the targeted skill is achieved. (p. 16)

The purpose of this research was to study the relationship between the amount of time students spent using the LexiaCore 5 program and the reading scale scores of elementary students in an intervention classroom located in a rural Middle Tennessee school. The independent variable was the amount of time engaged with the LexiaCore 5 program. This was measured from one minute to an unlimited number of minutes that students spent logged into the Lexia program. The dependent variable for this study was the students' increase/decrease in their reading scale scores as measured by the STAR reading assessment. The study population

consisted of students in grades kindergarten through fifth grade who scored below the 25th percentile on the initial STAR reading assessment. The study began in the fall of 2014 and continued until the spring of 2015.

This study built upon the research of McMurray (2013) and Regan et al. (2013). These particular studies focused on computer-assisted instructional programs such as the Lexia program. They focused on the effectiveness of these programs. This study examined the relationship between the amount of time engaged within the LexiaCore 5 program and changes in students' reading scale scores. This study contributed to the field of education by providing educators with information about the relationship between the amount of engagement time within the LexiaCore 5 program and changes in reading scale scores.

Research Question

The research question was as follows: Is there a relationship between the amount of time engaged with the LexiaCore 5 program and students' reading scale scores?

Assumptions

An assumption of this study was that students were actively engaged with the Lexia program when they logged into the system. This assumption suggested that minutes logged with the program were a true representation of engagement time.

Limitations

This study was limited to archived data collected from one participating school. The sample size was limited to students who were receiving intervention services through Tier II. Scheduling conflicts also created another limitation to this study. Non-instructional activities were often planned during the intervention time which interrupted students while engaged with the LexiaCore 5 program. Another limitation to this study was the amount of true engagement

time. Students were witnessed as being logged into the program, but they were not actively engaged in the activities. There were often technology issues that prevented the students from using the program on a daily basis.

Definition of Terms

1. LexiaCore 5-Web-based individualized reading curriculum designed for Pre-K through Grade 5 (Lexia Learning Company, 2012).

2. STAR- Standardized Test for the Assessment of Reading, a computer-adaptive reading test (McCabe, 2010).

3. CAI- Computer-assisted instruction, instructional programs designed to enhance instruction (Doe, 2008).

4. RTI- Response to Intervention, a framework model of instruction consisting of three tiers (Tennessee Department of Education, 2015).

5. Tier I- Core instruction for all students (Tennessee Department of Education, 2015).

6. Tier II- Research-based interventions used in a small group setting (Tennessee Department of Education, 2015).

7. Tier III- Intensive interventions with groups consisting of three or less students (Tennessee Department of Education, 2015).

8. Universal Screener- A nationally normed skills-based assessment given to all students (Tennessee Department of Education, 2015).

CHAPTER II

Review of Literature

Response to Intervention (RTI)

Response to Intervention (RTI) is also known as Response to Instruction and Intervention (RTI²). According to research by Chambers (2008):

> More states are requiring school districts to put response to intervention (RTI) processes
>
> into place and yet many administrators and teachers are uncertain about how to get
>
> started. The RTI process matches high-quality instruction and interventions to unique
>
> student needs." (p. 18)

The RTI model has been in the educational spotlight in other states for several years, but it has just been implemented in Tennessee this year. The RTI model focuses on screening students to identify any students who are not performing at grade level. Once these students have been identified, they are placed in a targeted intervention program in an effort to close the gap in their skill deficiencies. The RTI process is designed to be an early intervention in an attempt to correct the problems before they continue to impede the student's success in school (Chambers, 2008).

According to a research study conducted by Spencer, Wagner, Schatschneider, Quinn, Lopez, and Petscher (2014), "Over 2.5 million students are identified as having some form of learning disability and students with learning disabilities account for more than 41% of individuals who are eligible for special education services" (p. 161). Under the new RTI model adopted in the state of Tennessee, these students will be placed within the tiers of the model according to their own unique skill level. They will receive the same interventions as their peers

who perform at the same level on the universal screening tool adopted by the local school district. For this reason, it is crucial that intervention programs cater to the needs of all students.

Reading is the most important skill students can be taught while in elementary school. It is imperative that students leave elementary school reading on grade level. Berkeley and Lindstrom (2011) expressed this point in simplistic terms. "Learning is fluid and dynamic, and it begins at a point of entry for knowledge and information. For most of us that entry point is reading print" (p. 54). These simple words expressed how important it is for students to be able to read grade level text as they advance beyond elementary school. The RTI model was designed to achieve this goal by providing supplemental instruction and intervention to the students who would otherwise be faced with reading and comprehending informational text that increases in difficulty each year.

Along with incorporating technology into the classrooms and into the RTI model, researchers and educators are looking for other ways to boost the effectiveness of their RTI models. In a move to enhance the effectiveness of the RTI model, Ramaswami (2010) developed a research program on recognition and response (R and R). Recognition and response was developed to target and identify learners that needed additional help in early childhood. The R and R model is different from the RTI model because it targets all students, not just students who fall below the 25th percentile. "What R and R does is shift RTI's notion of intervention as something remedial to something that benefits all students regardless of their developmental level" (Ramaswami, 2010, p. 32). Time constraints came into play when trying to include all students in this model of instructional support, but limiting the model to early childhood education limits the number of students affected. Ramaswami (2010) was quick to point out that this model of R and R focused only on early childhood education within the Pre-K and

Kindergarten classrooms. This enabled teachers and interventionists to manage the increase in student numbers while still working with all students within this age range.

Technology (CAI)

The RTI model has changed the face of the traditional classroom. "In concept, RTI asks educators to carefully assess students' development and apply the appropriate resources to ensure each student develops the necessary skills" (McCabe, 2010, p. 28). Computer software and technology is allowing educators to meet this new challenge with the data to predict success and influence instructional decisions.

Technology plays a pivotal role in today's classrooms. Educators are using technology on a daily basis to deliver or supplement their instructional plans and activities. In a study conducted by Sorrell, Bell, and McCallum (2007), research indicated that computer-assisted instruction requires more investigative study. "Computer reading software is becoming widely available, but limited research has been conducted to demonstrate its instructional efficacy. The National Reading Panel called for research on the use of technology in reading instruction" (p. 1). The researchers described the traditional reading practice of guided reading in which the teacher listens as the students take turns reading text aloud. This process became a time consuming process and did not indicate a student's true skill level associated with reading. While the teacher gained useful insights into how well the students can read, she was not able to determine the exact skill deficit that needed to be addressed through intervention. Computer programs can complete this laborious task quickly (Sorrell, Bell, and McCallum, 2007). "Many educators regard technology in the classroom as an innovative educational necessity. With technological change occurring at a rapid pace, educational systems are pressured to locate the most beneficial programs on the market" (p. 11). Resources such as the What Works

Clearinghouse can offer support to educators as they face the difficult decision of purchasing and incorporating technology and software programs into their schools and classrooms.

Another aspect to using CAI programs to increase reading scores is the effect these programs have on students with disabilities. In a study conducted by Stetter and Hughes (2010), researchers found that "computer-based tools offer students with learning disabilities and reading difficulties interlinked support for reading" (p. 1). Today's classrooms include students who have a wide range of academic abilities. Teachers are faced with the task of differentiating their instruction in order to meet the needs of all the students in their classrooms even if these students have disabilities that make learning to read difficult. Computer-assisted instruction programs such as the Lexia Core 5 reading program can help teachers by assessing the individual student's strengths and weaknesses and designing activities that supplement the instruction given within Tier 1 (Stetter and Hughes, 2010). "Computers and other technology continue to transform as new iterations of electronic advances arrive in the marketplace" (p. 9).

In another study conducted by Regan, Berkeley, Hughes, and Kirby (2013), the researchers concluded that "difficulty with learning sounds that make up words significantly impacts students' ability to read" (p. 106). Students who lack this basic reading skill struggle to succeed as they advance through their elementary school years. Teachers in the upper elementary grades no longer focus on teaching students to read. They have shifted their instructional strategies to teaching through reading. Students who lack this basic decoding skill struggle across all curriculum domains because of this shift in instruction. In a study conducted by Regan et al. (2013), researchers addressed the issues associated with upper elementary students who were struggling to decode unfamiliar words and maintain reading fluency. They discussed how reading instruction beyond third grade shifts from a common strategy of learning

to read to reading to learn. Students who were still struggling with basic decoding strategies and phonemic awareness found themselves in a fast paced classroom where they began to fall behind their peers. Their reading grade level stalled at their current level and did not improve as they moved on to the upper elementary grades. Reading teachers in the fifth and sixth grade were faced with educating students who were reading on a first or second grade reading level. This was where differentiated instruction became essential. This skill gap can be addressed within the intervention classroom through differentiated instruction presented in a small group setting. "Differentiated instruction is a model intended to meet the widely diverse needs and ability levels of students in inclusive classrooms through flexible use of time, space, materials, and strategies" (Regan et al., 2013, p. 106). One way to provide the instruction these students need is through the use of CAI programs such as LexiaCore 5 reading program.

LexiaCore 5

Educators across the state and the nation are concerned about their students' academic achievement and growth each year. States are mandating programs that address the concerns over lagging achievement scores in reading.

> The results of the 2013 National Assessment of Educational Progress, known as "the nation's report card," show that 8th graders' average scores in math rose one point since 2011, the last time the test was given, and three points in reading on NAEP's 500-point scale. (Gewertz, 2013, p. 1)

While there was an increase in the reading scores of eighth graders, the news was not as encouraging when examining the scores of fourth graders across the nation. "Fourth graders gained 1 point in math; there was no statistically significant gain in reading" (Gewertz, 2013, p.1). To put this data into perspective, only 35 percent of fourth graders nationwide are

proficient in reading. There are three basic scoring categories for the NAEP assessment. The lowest is basic, followed by proficient, and then advanced is the highest. The numbers for proficiency in eighth grade were not much better at only 36 percent proficient in reading (Gewertz, 2013).

Giannelli-Artemie (2004) examined the relationship between the amount of time students were engaged with the LexiaCore 5 reading program and the reading scores of these students. This program is appropriately named because it consists of five different levels of instruction. "The five-level program is designed to promote acquisition and improve basic reading skills, with activities to develop and reinforce automaticity in recognizing phonic elements and sound/symbol relationships" (p. 65).

The Lexia Reading software was developed by a man named Bob Lemire (McMurray, 2013). He became motivated to design a program that focused on phonics after witnessing the results of a phonics based program that his son was using. His son had been diagnosed with dyslexia, and was attending a private school that specialized in teaching students who had dyslexia how to read. "Having seen the benefits for his child, he wanted every child with dyslexia to be able to access a phonics programme tailored to their needs" (McMurray, 2013, p. 16). The Lexia Reading program was the result of his desire to create a program that was more affordable for all students. Mr. Lemire's company, Lexia Learning Systems, was founded in 1984 (McMurray, 2013).

The five different levels within this program focus on specific reading skills. The activities became progressively harder as the students completed the activities within each level. The program is able to adjust and respond to the individual needs of each student as they work through the different levels and skills. "As the student works through the program, the program

automatically provides more practice depending on the response of the student to each task. If a student struggles, more practice is given" (McMurray, 2013, p. 16). This tailored-made instruction continued to adapt if a student continued to struggle after receiving additional practice on a specific skill. "If the same mistake is repeated and repeated, the program branches to versions of the activity that provide additional scaffolding such as hints and reduced stimuli" (McMurray, 2013, p.16). Once students mastered a skill, they were automatically advanced to the next skill on the next level. See Table 1 for a break-down of the skills Lexia targets.

Table 1

Grade Level	Phonological Awareness	Phonics	Structural Analysis	Automaticity Fluency	Vocabulary	Comprehension
Pre-K	*	*		*	*	*
K	*	*		*	*	*
Grade 1		*		*	*	*
Grade 2		*	*	*	*	*
Grade 3			*	*	*	*
Grade 4			*	*	*	*
Grade 5			*	*	*	*

Retrieved from Lexia Learning Company (2012)

"At Level 1, students practice basic phonemic skills including rhyming, blending, segmenting, and identifying beginning and ending sounds" (Doe, 2008, p. 48). Level 1 also contains "strategies necessary for recognition of short vowels in one-syllable words containing consonants, consonant digraphs and consonant blends" (Giannelli-Artemie, 2004, p.65). Levels two through four contain skill activities such as letter-sound correspondence, vowel patterns,

digraphs, decoding and word-attack strategies, comprehension skills, and sentence building activities. These activities are repeated and reinforced throughout each of these three levels with lessons that become more complex as the student advances through the levels. The final level is the most complex level. This level prepares students to become fluent readers by addressing skills such as affixes, root meanings, and higher level comprehension strategies (Doe, 2008). Students work at their own pace through the program, and activities are designed to strengthen each students' weaknesses in reading. "The program responds to what each student does and moves them to new and challenging material as needed" (Doe, 2008, p. 47). Embedded within the skill activities, students encountered games that promoted motivation which aided the success within the skill levels. The Lexia software "contains a series of game-based activities (e.g., matching words to pictures, word sorts, mazes, and cloze exercises) that directly target specific phonological awareness and/or phonics-based skills" (Regan, Berkeley, Hughes, and Kirby, 2013, p. 110).

The Lexia Core 5 reading program is able to reach more students because it incorporates different learning modalities such as visual, audio, and kinesthetic. These different modalities enable the program to successfully teach learners of all different learning styles (Spencer et al., 2014).

In a recent newsletter published by *Tech Learning*, the LexiaCore 5 program was described as an essential tool for implementing the Common Core Standards. The LexiaCore 5 reading program was described as "a technology-based program designed to systematically present content and skills identified as essential by the Common Core State Standards for ELA in grades K-5" (New Tools, 2013, p. 36). While professionals within the field of education and technology reviewed and evaluated the Lexia program, they identified it as being a valuable and

useful tool, but the guidelines for use are rarely discussed in these evaluations. This is an area that needs to be explored with new research focusing on implementation procedures which includes engagement time and recommendations.

Another aspect of today's state-mandated protocol includes stipulations that reading instruction occurs within a 90-minute block of uninterrupted instruction. Students can become distracted and disinterested during an hour and a half of reading instruction. One way to combat this problem is to differentiate the instruction by including small group activities such as computer-based programs. The LexiaCore 5 reading program is one such program that can be used within the 90-minute block of instruction. Teachers may choose to use a rotating center set-up in which the computer program is located at one of the centers. Students rotate around the centers in small groups. They can spend 20 to 30 minutes at each center. This would meet the suggested time requirements for the LexiaCore 5 reading program. Students who use the computer have the opportunity "to strengthen basic skills, including decoding, reading fluency, vocabulary, and comprehension" (Manzo, 2007, p. 11).

The Lexia Learning Company covers a wide range of reading products that are all designed to enhance reading skills. The different products are known by various names, but they are all part of the central Lexia Learning System. This system also includes the program known as Primary Reading. This program is designed for a targeted age group of learners who are from five to eight year olds. "Primary Reading learners have the opportunity to improve phonemic awareness, sight words, vocabulary, sound/symbol correspondence, listening, and comprehension skills" (Lafferty, 2005, pp. 14-15). This program utilized various animations which were designed to enhance the students' interest level. These animations helped to engage

younger readers as they progressed through the levels and activities offered within this component of the Lexia Core 5 reading program.

In a separate software review, Giannelli-Artemie (2004) stated, "The computer program is visually stimulating, with well-organized screens and minimal graphics, utilizing color and sound for attention and reinforcement" (p. 66). All students have the ability to make gains in their reading skills while using the Lexia Core 5 program. However, it was designed with a targeted student demographic in mind. The Lexia Reading program "originally was intended for students with dyslexia; however, individuals with other learning disabilities and low achievers should also experience success" (Giannelli-Artemie, 2004, p. 66).

In a review of this software, Doe (2008) stated, "Lexia Reading v5 is an impressive and complete computer-delivered supplemental reading program" (p.47). The Lexia Reading v5 program is internet-based which means that students can access the program at various locations outside of the classroom. Students can log into the program through any computer with an internet connection. Being able to access the program outside of the classroom has many advantages. The most obvious advantage is an increase in the amount of time in which the student is engaged with the program. Students can access Lexia Reading v5 at school, home, libraries, and various other locations. Since it is web-based, another advantage of this program is the ability to analyze the data and report on this data. According to Doe (2008), "The program's internet-based management segment offers a complete range of data collection and reporting features" (p. 47). These reporting features allow educators to track students and monitor their progress while in the program. This data can then be easily shared with school and district administrators (Doe, 2008).

The advantages of using the LexiaCore 5 program are directly associated with the availability of more instructional time. Instructional time is an important component of classrooms. Teachers strive to find the time to teach the necessary skills for success each year. In addition to daily activities, teachers meet with parents, administrators, and other faculty members in order to plan the best course of action for their students. They face various challenges ranging from an overcrowded classroom to differentiating instruction for the different ability levels of the students. Finding the time to deliver high quality differentiated instructional lessons can be a challenge. Computer-assisted instructional programs such as LexiaCore 5 can provide teachers with an instructional tool which enables them to differentiate their reading instruction for struggling readers. These programs are also time saving by utilizing computers in a small group setting. Some facts reported by the Lexia Learning company include the following: "Educators spend, on average, 20 days focused on assessment of reading skills. One-third of K-5 educators spend one-and-one-half months assessing reading skills. Students spend, on average, eight entire instructional days each year taking reading tests" (Lexia Learning Company, 2012, p. 12). When faced with figures such as these, teachers can benefit from using reading assessment tools that will monitor and track student progress for them. "Students are assessed as they engage with the program (auto-assessment). This auto-assessment means they do not have to be assessed in a separate test session" (McMurray, 2013, p. 16). This auto-assessment is described by Regan, Berkeley, Hughes, and Kirby (2013) as being "a 5-7 min computer test of phonics, decoding skills, and automaticity" (p. 108).

Since instructional time is valuable to classroom teachers and students, another issue is apparent when using the LexiaCore 5 reading program. While the program itself will reduce the amount of time teachers spend assessing reading skills and planning supplemental activities, the

question of how much time should be spent engaged with the program becomes an essential question. One software reviewer of computer assisted instructional programs suggested the following, "The software is designed for intensive use-three to five times per week, for 20-40 minutes each time-so it requires a considerable time commitment" (Lankutis, 2004, p. 22). While this study suggested this engagement time, other studies cannot clearly identify how much time should be spent engaged with an intervention program. "However, the issue of how long is needed on a phonics intervention is by no means clear and it seems reasonable to suggest that individual needs would more adequately dictate time spent on any intervention" (McMurray, 2013, p. 19). In a study conducted by Regan et al. (2013), the amount of time engaged with the LexiaCore 5 program was defined in a similar amount. This study examined how much time was spent working with the Lexia Program, Strategies for Older Students (SOS), component of the reading program. This component was designed for students in grades sixth through eighth, while LexiaCore 5 was designed for students in grades kindergarten through fifth. "Lexia SOS recommends students work for at least 45 to 60 min per week in blocks of 15 to 20 min" (p. 110).

The time commitment issue could potentially cause teachers to avoid using the program. According to McMurray (2013), "The ability of the class teacher to be able to deliver an individual programme of phonics is unrealistic in today's classrooms due to the considerable demand this would place on teacher time" (p. 16). One solution to this issue was to use the program as an intervention tool outside of the regular educational classroom.

In a recent study by McMurray (2013), the Lexia Reading program was used as an intervention with struggling readers. Reading scores for this group were compared to the reading scores of a similar control group. The study found "when standardized reading scores for the

intervention and control groups were compared, the intervention group made significantly greater progress in reading than the control group" (p. 15). Teachers within this study identified aspects of the Lexia Reading program that were beneficial to the students' ability to learn and succeed in the classroom. Some of these aspects included the following, "increased concentration, improved phonological awareness, children working at their own pace and receiving additional support, supports existing spelling scheme used in the school, rehearses and consolidates letter sounds and names, and builds childrens' confidence" (p. 22).

The Lexia Reading program offers an easy to use time tracking report, but the teachers within a study conducted by McMurray (2013) admitted to not using the online tools available with the program. "The majority of teachers did not use the online Lexia support materials. One teacher indicated that this was due to their inability to fit this in with strict timescale of the curriculum" (p.22). In another study, the online tools that were found to be beneficial involved data collection tools. "The program tracks student accuracy, frequency of errors, and speed, and uses these data to provide information to the student and the teacher" (Regan et al., 2013, p. 110). One possible solution to this issue of time constraints was to have intervention teachers responsible for tracking the time the students spent engaged with the program. This would unburden some of the responsibility from the classroom teacher while ensuring that the Lexia program was being used efficiently and with fidelity (McMurray, 2013).

In the study conducted by McMurray (2013), the amount of time engaged in the Lexia program resulted in a higher progression rate within the program, but not a significant difference in the students' reading scores:

Although Lexia recommend that the software is used regularly, a minimum of three 20-minute sessions per week, the results of the regression analysis indicates that time spent on Lexia did not significantly contribute to the amount of variance explained in final reading scores, whereas the Lexia level achieved did. (p. 23)

The level achieved demonstrated how far students progressed through the different skill levels of LexiaCore 5. It would stand to reason that students who spent more time on the program would master more levels when compared to students who spent less time engaged with the program. This study also noted that "some of the children who had not progressed through the program as far as other children, even though they had high usage patterns, had poorer performance in the final reading test" (McMurray, 2013, p. 23). This finding could indicate that these students may need a more aggressive intervention. The conclusion of this study indicated that this program would be more beneficial when used within a small group intervention classroom as compared to a regular grade level classroom. McMurray (2013) concluded, "This individualized approach and the detailed assessment data that can be gleaned from it would be difficult to generate in a 'one size fits all' whole-class intervention" (p. 25). The findings of this study did not list an official amount of recommended usage time.

One interesting aspect to this research came to light when reading the concluding remarks from the Regan et al. (2013) study. "It is important to note that all students, save one, required additional direct instruction for at least one of their target skills to reach a mastery level" (pp. 116-117). This direct instruction can come in the form of teacher created activities that focus on the deficient skill, or the teacher can use the skill builder activities that the Lexia Core 5 reading program provides. The program provides skill builder activities for all of the skills taught within the program. These skill builder activities can be downloaded and printed to use during the

direct instruction component. LexiaCore 5 will automatically alert the teacher when a student needs to utilize this direct instruction activity. "Findings suggest that the use of Lexia SOS with additional direct instruction reinforcement may be an effective way to differentiate instruction for some students" (Regan et al., 2013, p. 117).

Researchers suggested a follow-up study to examine how the Lexia program can be used within an intervention classroom. "An important follow-up to the current study would be to examine how Lexia SOS and other CAI programs can fit into the framework of tiered remedial models like Response to Intervention (RTI)" (p. 118).

While the review of literature indicates a large amount of research into the areas of technology and computer-based programs and how they can be used to meet the challenges of the new RTI models, there was limited research on the relationship between the amount of time engaged with these programs and students' reading scores. There were basic guidelines for implementing these programs but no research to indicate the effectiveness of these programs when the amount of time is altered from the recommended amount. This research explored this area. The research hypothesis was as follows: There is a relationship between the amount of time engaged with the LexiaCore 5 program and students' reading scores.

CHAPTER III

Method

Participants

Archived data was used for analysis purposes, and was generated by the STAR reading assessment for students in kindergarten through fifth grade. The students involved in this study attended a rural school in Middle Tennessee. This school was a Title 1 school with approximately 76 percent of the student population qualifying for the Free and Reduced Lunch Program. The diversity among the student population was very limited. Caucasians represented approximately 90 percent of the student population. There were 69 archived records pulled for this study. The archived records consisted of STAR reading reports and LexiaCore 5 usage reports. The STAR reading report generated test data which consisted of a scale score, grade-level equivalent, and percentile rank. For this study, the scale score was analyzed. The grade level breakdown of these records was as follows: kindergarten $n = 5$, first grade $n = 14$, second grade $n = 13$, third grade $n = 14$, fourth grade $n = 11$, and fifth grade $n = 12$. These archived records were chosen based upon the percentile rank on the STAR (Standardized Test for the Assessment of Reading) assessment. Test results which fell at or below the 25th percentile were included in this field study.

Materials

For this study, the independent variable was the amount of time students were engaged in the LexiaCore 5 program. This phonics based program is a web-based program that can be accessed at www.lexiacore5.com Students begin the Lexia program by completing a program generated assessment. The program then places each student in an appropriate skill level depending on the results of the assessment. A weekly engagement goal is determined by the

program. This goal is listed as recommended minutes per week, which are different for each student. The students involved in this study met the recommended weekly goals. The independent variable was measured from a minimum of one minute to a maximum of unlimited minutes. This time measurement was calculated by the LexiaCore 5 program that represented the amount of minutes each student was logged into the program. This engagement time was retrieved from a usage report generated by the LexiaCore 5 program. The dependent variable was the students' increase/decrease in their reading scale scores, as measured by the STAR reading assessment.

This assessment was developed by the Renaissance Learning Company (Renaissance Learning, 2014). The Middle Tennessee school district involved in this study has a subscription with this company. This assessment measures basic components of reading such as phonic awareness, phonics, fluency, sight words, and reading comprehension. The scale score used in this study was determined by using a sliding scale in which the lowest score is a 0, and the highest score is a 1400. The STAR assessment was administered at the beginning of the field study and then again at the end of the study to determine if the students' reading scale scores increased or decreased. All students in grades K-5 participated in this assessment process.

Procedures

The design of this field study was a correlational design. The information gained from the independent and dependent variables was analyzed to determine if a relationship existed between the amount of time engaged with the LexiaCore 5 program and an increase or decrease in students' reading scale scores. Students who worked with this program were assigned a weekly goal for time engagement that was predetermined by the LexiaCore 5 program after the students had taken an initial screening assessment within the program. These goals are program

CHAPTER IV

Results

Archived data was analyzed to determine if a relationship existed between the amount of time (measured in minutes) students were engaged with the LexiaCore 5 reading program and an increase or decrease in students' reading scale scores as measured by the STAR assessment. Archived data for each grade level, kindergarten through fifth grade, was analyzed using the Pearson correlation coefficient (r). Numerical values for r fall within a range of -1.00 to +1.00. The numerical value indicates the strength of the relationship. Stronger relationships are closer to -1.00 and +1.00 with weaker relationships closer to 0. This data was also compiled into a school-wide analysis using this statistical method. Table 2 displays the results of the statistical analysis of the archived data.

Table 2

Grade Level	r	n = sample size	x̄= Pre-Lexia Score	x̄= Post-Lexia Score	x̄=Minutes Engaged Fall to Spring
Kindergarten	-0.24	5	479	742	922
First Grade	-0.58	14	581	738	1417
Second Grade	-0.01	13	100	262	1079
Third Grade	0.01	14	206	324	1528
Fourth Grade	0.23	11	294	424	1356
Fifth Grade	-0.42	12	415	533	836
School-wide	-0.24	69	332	479	1229

*All reading scores compiled from the archived data demonstrated increases/gains

The school-wide r = -0.24 indicated a weak negative relationship between an increase in reading scores and the time engaged with the LexiaCore 5 reading program. This weak relationship is interpreted with the following statement: An increase in the amount of time engaged with the LexiaCore 5 program does not result in an increase a student's reading scale score.

The r^2 value was also calculated for each grade level, see Table 3.

Table 3

| Grade Level	r^2	n = sample size
Kindergarten	0.0575	5
First Grade	0.3378	14
Second Grade	0.0001	13
Third Grade	0.0001	14
Fourth Grade	0.0776	11
Fifth Grade	0.1755	12
School-wide	0.0599	69

When assessing the results for each grade level, the strongest relationship between the pairs of quantitative variables was found within the first grade. The first grade r = -0.58. This correlation coefficient is visualized with Chart 1.

Chart 1
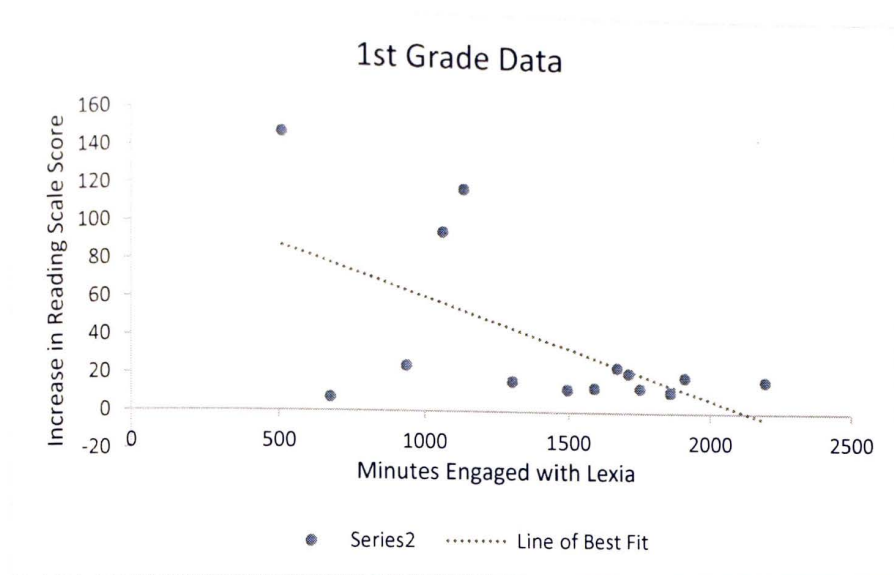
1st Grade Data

This chart demonstrates the presence of three outliers in the archived data for the first grade students. Chart 2 provides a visual representation of the school-wide data via a scatterplot. The school-wide $r = -0.24$ which indicated a weak relationship. The school-wide data also contained outliers. There is not a clearly defined relationship visible with this scatterplot.

Chart 2

K-5th Grade Data
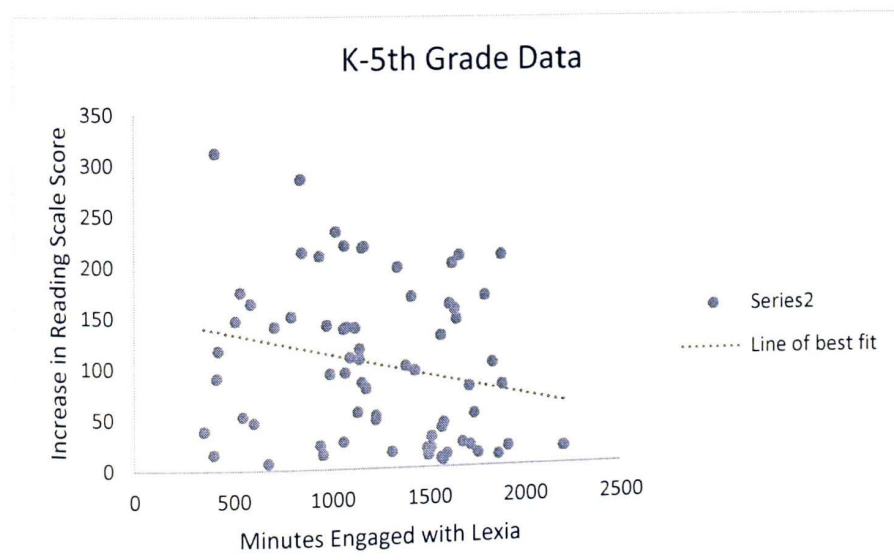
In conjunction with the strongest negative grade level relationship, the strongest positive grade level relationship was found to be fourth grade. The fourth grade $r = 0.23$. Chart 3 displays the fourth grade scatterplot.

Chart 3
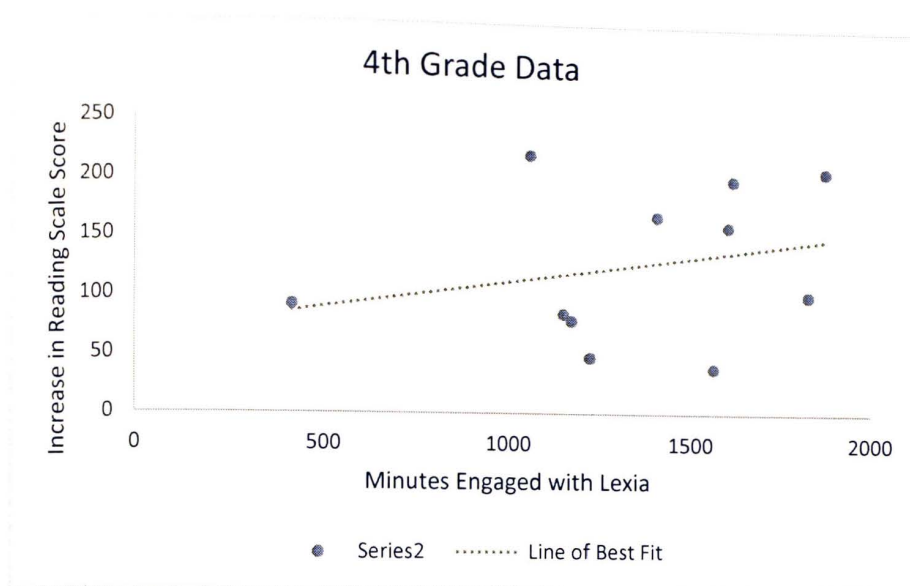
When analyzing the data by grade level, the study results indicated that within the school each grade level had a unique correlation coefficient indicating that across grade levels students responded differently to the LexiaCore 5 program. The negative relationships indicated that increasing the time engaged with the program decreases the gains in the reading scale scores. A positive relationship indicated an increase in engagement time increased the gains in the reading scale scores. As a school, the relationship was described as a weak negative relationship. When analyzing the data by grade level, the study results were mixed. The strongest negative relationship was found in the first grade. These results indicated that the more time students spent on the LexiaCore 5 program the lower the gains made on the STAR assessment. This could be due to a maturity issue or an inability to stay on task during engagement time. Second

grade and third grade exhibited no relationship with r values almost at zero. The fourth grade results showed the strongest positive relationship; however, the fifth grade results indicated a negative relationship.

CHAPTER V

Discussion and Conclusions

The absence of a strong relationship between the time engaged within the LexiaCore 5 reading program and an increase/decrease in students' reading scale scores was reported with this correlational study. This finding could cause reading teachers and interventionists to consider other options outside of a CAI program when planning for lessons and activities within the intervention classroom. The findings of this research study indicate that the LexiaCore 5 program should be used as a supplemental program. This program provides activities and instruction that target the basic elements of reading instruction. By using CAI, teachers have more time available to assist other students in the classroom. Students are also excited about the interactive characters and computer graphics that are incorporated into the LexiaCore 5 program. However, this program should not become the focus of the reading instruction. It should support the Tier I instruction while providing remediation to the students who are struggling with the basic skills of reading.

The results of the study indicated that all students involved made gains on their reading scale score. These gains could have been the result of the core instruction that all students receive in the regular education classroom under Tier I of the RTI model of instruction. It was not possible to determine if the gains were a direct result of the use of the LexiaCore 5 reading program or this classroom instruction.

Doe (2008) stated, "Lexia Reading v5 is an impressive and complete computer-delivered supplemental reading program" (p.47). The key word from this quote would be "supplemental". According to the findings of this study, and other researchers (Doe, 2008), interventionists and reading teachers should not use CAI programs as their only instructional activity and material.

program began this process. They would try to use the mouse to answer the questions the program was modeling for them. Once they saw that they could not click on an answer during this period, they would remove their hands from the mouse and become disinterested. The intervention teachers would spend several minutes each day redirecting the students' attention back to the program in order to help them to progress through the activities and levels. Problems with attention and using the required technology could have resulted in the negative relationship that was indicated by the research for grades kindergarten and first grade.

The research results for second and third grade indicated that there was no relationship between the study variables. The amount of time students spent engaged with the Lexia program did not have any effect on their reading scale score. This indicates that these students did not receive any benefit from working with the program. This appears to be an ineffective program for these two grade levels. It could not be determined if this was a grade level issue that could possibly reoccur each year, or if this was an issue directly related to the individual needs of the student population for these two grades. This was the first year for the Lexia program. It should be monitored next year in an effort to determine if the issue is related to the grade level or the student population.

It must also be noted that scheduling conflicts were abundant with the second grade. This grade level received its intervention services during the final hour of each day, 1:30-2:30. This is also the time reserved for special events and occasions within the classroom. Events such as birthday cupcakes, holiday themed parties, and reward recess time have to be scheduled during this time of the school day. This was a concern during the research study. On ten separate occasions, the second grade students in Tier II did not receive any instruction because of these

special events. The interventionist maintained a log of the instances in which these events interrupted the LexiaCore 5 instructional time.

The fourth grade results indicated a weak positive relationship. One possible explanation for these results was the Tier I instruction. A new fourth grade reading and language arts teacher was hired at the beginning of this school year. This teacher created an excited and energetic classroom for the fourth grade students. She incorporated technology into her lesson plans on a daily basis. The students were allowed to use the computers and they became more confident in their ability to use the technology available. These students did not struggle with the technical aspects of the LexiaCore 5 program.

Fifth grade results indicated a stronger negative relationship. This could have been attributed to the perception that the Lexia program was for "babies". Several of the fifth grade students did not enjoy the animal characters and various animations that were embedded within the program. They expressed a disinterest in using the program. The intervention teacher witnessed several students logging into the program but not working unless the teacher forced the issue.

Future Research

Further research is needed to answer the question: How much time is the optimal amount of time to be engaged with the LexiaCore 5 reading program? Due to the fact that this study indicated only a weak school-wide relationship with a r of -0.24, additional research studies should be conducted to determine the most effective amount of program engagement time. Classroom time is valuable and teachers need to know the minimal amount of time which produces the maximum amount of results in order to enhance each students' learning experience.

Additional statistical analysis would be beneficial to obtain a level of significance in pre- and post-scores.

Recommendations

The LexiaCore 5 program should be used as a supplemental program. It should not be the only program used for intervention. Younger students, kindergarten and first grade, should have a decreased amount of program engagement time. Technology should be incorporated within the daily classroom activities. Second and third grade should be evaluated due to the findings of no relationship between the study variables. Fifth grade students who seem disinterested with the program should transition into the Lexia SOS (Strategies for Older Students) program.

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APPENDIXES

APPENDIX A

School District Approval Letter

"Preparing Students for Tomorrow"

P.O. Box 209
Erin, Tennessee 37061
Telephone: (931) 289-4148
Fax: (931) 289-5543

CATHY HARVEY, *Director*

Houston County
BOARD OF EDUCATION

TOMMY BEECHUM, *Board Chairman*

March 26, 2015

To Whom It May Concern:

This letter is to verify that Kelly Brown may collect student data at TN Ridge Elementary School for educational research purposes. Ms. Brown is aware that personal student information may not be shared and she has developed a system to protect student identities. Our school board policy also states that the information will be destroyed when no longer needed for the purpose for which the study was conducted.

Please contact me if you have any questions or concerns.

Sincerely,

Kris McAskill
K-8 Director of Teaching & Learning

All participants agree to the aforementioned information.

_____   3-26-15
Principal   Date

_____   3-26-15
Researcher   Date

_____, Ph.D. 3/27/15
University Representative   Date

APPENDIX B

Approval Letter from Austin Peay State University IRB

AUSTIN PEAY STATE UNIVERSITY INSTITUTIONAL REVIEW BOARD

Date: April 7, 2015

RE: 15-023: The Lexia program and reading scores within the intervention classroom

Notice of Exemption 45 CFR 46.101 (b)(4) -Research involving the use of existing data, data is not recorded in a way that can be linked to participants.

Dear Kelly D. Brown,

We appreciate your cooperation with the human research review process at Austin Peay State University.

This is to confirm that your proposal has been reviewed and meets the requirements of exemption from further review. Exemption is granted under the Common Rule 45 CFR 46.101 (b) (4).

You may conduct your study as described in your application, effective immediately. Please note that any changes to the study have the potential for changing the exempt status of your study, and must be promptly reported and approved by APIRB before continuing. Some changes may be approved by expedited review; others require full board review. If you have any questions or require further information, you can contact me by phone (931-221-6106) or email (shepherdo@apsu.edu).
Again, thank you for your cooperation with the APSU IRB and the human research review process.

Sincerely,

Omie Shepherd, Chair

Austin Peay Institutional Review Board

Cc: Dr. Benita Bruster