ABSTRACT

WILSON, MELODY TYLER. Using the Technological Pedagogical Content Knowledge (TPCK) Framework to Explore Teachers’ Perceptions of the Role of Technology in the Implementation of mCLASS®: Reading 3D. (Under the direction of Dr. Lance Fusarelli.)

This qualitative study considers the perceptions of teachers from one rural county in North Carolina who implemented the program implementation of mCLASS®: Reading 3D. Reading 3D is an electronic early literacy assessment that is designed to assist teachers in planning appropriate literacy instruction based on student needs by offering immediate access to individual student data.

This study sought to provide perspectives about which aspects of technology are occurring in schools and the degree to which actual practices resemble North Carolina’s intended delivery of the Reading 3D program. The primary framework that was used to understand the teachers’ perceptions was the Technological Pedagogical Content Knowledge (TPCK) Framework. The purpose of TPCK is to recognize the information that is needed for teachers to be able to properly integrate technology into their teaching.

The findings were acquired by surveying 26 teachers, reviewing online documents, and interviewing eight participants through stratified random sampling.

Although the findings of this study were guided primarily through the TPCK framework, there was a secondary interest in perceptual theory. The results showed that although teachers appreciated the capabilities of the technology, they were not using it to its full potential. These findings suggest that schools seeking to implement technology based early literacy assessment programs such as mCLASS®: Reading 3D should offer specific
professional development plans, solicit teacher input on county-wide standards, and acquire updated technology for a positive implementation climate.

The theoretical implications included closer monitoring of all programs, connection of program to improved student achievement as well as offering appropriate training that supports new technology. There are also implications for future research including investigating the reliability of the assessments before using this assessment as its main support to guiding instruction, adding to the participant pull - including the principals and other staff members, and examining the impact that this program is having on student achievement.

Although the findings from this study would not be considered generalizable, the findings would be deemed useful to other rural counties who are implementing mCLASS ®: Reading 3D.
Using the Technological Pedagogical Content Knowledge (TPCK) Framework to Explore Teachers’ Perceptions of the Role of Technology in the Implementation of mCLASS®: Reading 3D

by
Melody Tyler Wilson

A dissertation submitted to the Graduate Faculty of North Carolina State University in partial fulfillment of the requirements for the degree of Doctor of Education

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APPROVED BY:

______________________________  _______________________________
Lance D. Fusarelli, Ph. D.      Kenneth H. Brinson, Jnr., Ph. D.
Chair of Advisory Committee

______________________________  _______________________________
Bonnie C. Fusarelli, Ph. D.     Steven J. Amendum, Ph. D.
DEDICATION

I dedicate this dissertation to my wonderful husband, Gilbert, and my two amazing sons, Tyler and Austin, for your inspiration, love, support, and everlasting patience as I spent numerous hours working on this study.
BIOGRAPHY

Melody Tyler Wilson was born on August 8th in Hagerstown, Maryland where she lived with her parents, three brothers, and three sisters. While growing up, her family traveled around the country with their missionary father and mother.

In 2000, she graduated with her Bachelor of Science in Elementary Education from Shippensburg University in Pennsylvania. Once receiving her teaching license, she moved to North Carolina and received her Master of School Administration from North Carolina State University. Since moving to North Carolina, she has been a teacher, assistant principal, and is currently serving children as a principal of an elementary school. She is nationally board certified in literacy and has a passion for building a respectful learning environment in which children can excel.

Outside of education, her hobbies include reading, photography and scrapbooking. However, her favorite pass time is having fun with her family. She currently lives in North Carolina with her husband and two young sons.
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Chapter 1

Introduction

One of the schools’ most original responsibilities was to teach children how to read. Researchers (Fletcher & Lyon, 1998) estimated that 95 percent of all children could learn how to read. Yet in 2009, only 61 percent of the students in North Carolina were considered proficient on the Reading End of Grade (EOG) Assessments in Grades 3-5 (NCDPI, 2010). In a white paper, Honey (2007) explained, “Despite evidence that formative assessment in the early years allows educators to identify student needs, enabling them to help students build skills and increase proficiency, few districts and states have any sort of systemic formative program for K-2” (p. 5).

Early literacy intervention is a widely discussed educational concern. There is varying research on the top five elements of reading. Some research stated that there are five core components of effective reading instruction; phonics, phonemic awareness, fluency, comprehension, and vocabulary (NICHD, 2000). Other research identified the big ideas of beginning reading as phonemic awareness, alphabetic principle, accuracy and fluency, comprehension, and vocabulary (Barone, Mallette, & Xu, 2005; Reading Resource, 2011). Although it is widely recognized that there are essential components in early literacy, North Carolina continues to struggle to improve the literacy of its children.

In 2009-2010, the state of North Carolina piloted a technology-based reading assessment program to address these low literacy rates throughout the state. Due to the political pressure of low literacy rates and the concern for 21st century learning, the goal of
this program was to improve student achievement in early literacy. There were 47 schools involved in this Diagnostic Reading Assessment Pilot (DRAP) program that utilized mCLASS®: Reading 3D (Reading 3D). In August of 2010, the final evaluation report was presented to the North Carolina General Assembly. Based on the positive results of the report, additional school districts were selected to participate in the implementation of Reading 3D. Due to budget constraints, a limited number of schools were selected to participate in this program at the state’s expense. Schools were selected based on EOG data from 2009-10 and the state mandated that every school with a composite score of 55.9% or below would participate in Reading 3D. Each year, the state determines each school’s composite score by computing the percent of students who scored at or above Achievement Level III on reading and mathematics EOG tests, the North Carolina Alternate Assessment Portfolio, and the North Carolina Alternate Assessment Academic Inventory (NCAAAI). See Appendix A for a detailed explanation of composite score.

In 2010-11, 47 pilot schools, joined by 78 former Reading First schools and 75 low performing schools, participated in Cohort I; 236 were selected from applications for Cohort II; and 67 more were selected for Cohort III. In this year of implementation, a total of 483 schools or 36 percent of the elementary schools in North Carolina participated in the implementation of Reading 3D (wirelessgeneration.com, 2010).

As part of Governor Beverly Perdue’s Ready, Set, Go! initiative, NCDPI, North Carolina Teacher Academy, and Wireless Generation partnered to implement mCLASS®:
Reading 3D as the diagnostic assessment for reading in elementary grades as part of a state-wide initiative. This diagnostic assessment aims to:

- Enable teachers to determine student-learning needs and individualize instruction.
- Ensure that students are adequately prepared for the next level of coursework as set out by the Standard Course of Study.
- Save time by using technology to accurately record information.
- Facilitate more frequent formative assessment for struggling students.
- Make it possible to provide interventions for students in a timely manner.

(wirelessgeneration.com, 2010)

Wireless Generation assists educators in this assessment process by offering mCLASS®: Reading 3D on a handheld type of technological device. In an effort to guide instruction, Reading 3D instantly provides differentiated lessons and web-based reporting.

The Reading 3D program includes multiple formative assessments of students in Kindergarten through Grade 3. Reading 3D identifies the need for progress monitoring by taking the following steps: assess students; consult, analyze and discuss data; create small groups and tailor instruction; and then monitor their progress. The ultimate goal of Reading 3D is to create data conversations that educators use to guide instruction. Reading 3D provides teachers with data to plan small-group instruction that supports improving literacy skills. Each skill must be evaluated to make sure it is at the appropriate level of challenge and intensity level for each student. According to Pressman & Wildavsky (1984) we can also
learn how to alter programs by moving beyond simply evaluating a program. Pressman & Wildavsky (1984) went on to explain that, “By expanding the task of evaluation beyond the mere measurement of outcomes to their causes, we can obtain knowledge that can be used to alter programs and/or their modes of implementation” (p. xv). In order to evaluate the outcomes of this program, it is essential to understand the implementation of this program.

**Program Implementation**

McNamara (2007) explained, “The assessment of reading comprehension is a critical part of designing and implementing programs that teach reading strategies” (p. 107). In an attempt to improve student achievement in reading, new programs continue to be implemented in education. Patton (2002) believed, “unless one knows that a program is operating according to design, there may be little reason to expect it to produce the desired outcomes” (p. 161). Therefore, there is a need to reflect on the impact that programs have on student achievement. When evaluating program implementation, the evaluator should assess whether the program is reaching the appropriate population or if its service delivery is consistent with program expectations (Preuss, 2007; Rossi, Lipsey, & Freeman, 2004). This study obtained data from one rural North Carolina county that has implemented Reading 3D in their elementary schools.

The county of study serves approximately 9,000 students. Within this county, there are nine elementary schools that serve students in kindergarten through fifth grades. Two of these elementary schools are located approximately two miles apart and had a composite score below 55.9% and therefore were selected by the state to participate in Cohort I of the
implementation of Reading 3D. The state offered open enrollment participation through an application process and two more schools in this county were selected to participate in Reading 3D. These four schools selected for data collection in this qualitative study. This study focused on the teachers’ perceptions of the implementation of this technology-based early literacy assessment program.

People use different types of technology repeatedly throughout their day. Yet the educational institutions charged with preparing youth for productive lives are farther behind in integrating technology than any other institution in American society (Guthrie, 2003). Although many schools have been permeated with technology (Molebash & Fisher, 2003), many teachers have resisted technology, viewing it merely as an additional task or burden to learn. Technology has the potential for making remarkable changes in pedagogy and student learning; however, classroom use has lagged (Guthrie, 2003). To further complicate matters, emergent technology may be leading to a redefinition of literacy, as societal demands and a borderless world await students, and instruction in classrooms struggle to meet those demands (Leu, Kinzer, Coiro, & Cammack, 2004).

Pressman and Wildavsky (1984) shared that “implementers must know what they are supposed to do in order to be effective” (p. 165). Therefore, this program has a doubly challenging implementation. Participants will focus on learning both the technology and reading assessment aspects of this program. Teachers tend to consider technology to be a domain that is totally different from pedagogy and find it difficult to navigate between those
two worlds. Instead of this dual challenge, educators should view this technology as a way to assist pedagogy by providing an easier way to collect and analyze reading assessment data.

**Purpose of the Study**

The purpose of this study was to understand how teachers perceive the program implementation and the role of technology in the reading assessment program called mCLASS: Reading 3D.

The following research questions will guide this qualitative perceptual study:

1. What are the teachers’ perceptions of the implementation of the Reading 3D program?

2. For teachers implementing Reading 3D in grades K-3, what are their perceptions regarding the implementation process of Reading 3D as it relates to the role of technology?

The results revealed the perspectives from teachers about how technology impacted the implementation of Reading 3D. Knowing the extent to which technology in Reading 3D is implemented will allow us to better understand which program characteristics are contributing to the desired outcomes. Furthermore, the results may reveal some unrealistic sections of the program, and thus provide information to Wireless Generation about how to improve this technology-based diagnostic reading assessment program.

**Significance of the Study**

This study offered valuable information on the implementation and application of a technology-based reading assessment program offered through Wireless Generation.
Literacy expectations, too, have advanced from the basic paper and pencil assignments to publishing with technology (Clay, 2001; Coiro, Knobel, Lankshear, & Leu, 2008; Leu et al., 2004). The AACTE Committee (2008) commented, “Literacy will constantly be redefined as new technologies emerge and as expectations change for what it means to be literate” (p. 63). Herrington, Hodgson, and Moran (2009) predicted that, “by 2011, it would be hard to argue for the validity of an assessment in writing that did not provide for digital composing” (p. vii). Therefore, this study may be considered cutting edge and could be used to help further investigate literacy initiatives in the future.

The state of North Carolina as well as school districts and individual campuses have invested significant amounts of money in technology. Last year alone, North Carolina allocated 34.6 million dollars from Race to the Top funds for technology infrastructure in education (NCDPI, 2011). These technology allotments have stayed consistent despite a state budget crisis and cuts to other areas of the budget. In the county of study, Board Policy Code: 3220 - Technology in the Educational Program stated, “The board strives to incorporate the use of technology in the educational program in order to enhance instructional opportunities, appeal to different learning styles and meet the educational goals of the board”. It is significant to understand the perceptions that teachers have on the impact that this technology has on student achievement.

This study may also contribute to the research literature by building on the broader influences of technology-based literacy assessments. Teacher perceptions on the implementation of mCLASS®: Reading 3D has had limited research since it is a new
program. The findings of this perceptual study may inform other research regarding the impact that technology has on literacy.

**Brief Overview of Methodology**

Merriam (1998) affirmed, “The qualitative, interpretive, or naturalistic research paradigm defines the methods and techniques most suitable for collecting and analyzing data” (p. 1). Qualitative research is suited for promoting a deep understanding of a social setting or activity as viewed from the perspective of the research participants. This approach implies an emphasis on exploration, discovery, and description (Bloomberg & Volpe, 2008). A qualitative perceptual study is an appropriate method to study teachers’ perceptions of program implementation in a small sample of schools.

**Conceptual Framework**

Through this research design, I considered many conceptual frameworks on which to base this study. When analyzing behavior change theory, it was realized that this would not align with the purpose of the study because this study is not measuring the change in participant’s behaviors. After more research, generational theory was reviewed for possible analysis. This theory was based on more than just technology and did not align with the literacy side of this study. Shulman’s pedagogical content knowledge (PDK) showed the importance of integrating the pedagogical knowledge with the various contents teachers must know. However, there was not a technology component, but the technological pedagogical content knowledge (TPCK) framework includes pedagogy, content, and technology, all of the important components necessary in this study.
TPCK is a framework for teacher knowledge in technology integration. It builds on Shulman's (1986) construct of pedagogical content knowledge (PCK) to include technology knowledge. The TPCK framework is a complex interaction among three bodies of knowledge: Content, Pedagogy, and Technology (see Figure 1 on page 14). Through this lens, I sought to understand teachers’ perceptions on the impact that technology in Reading 3D has had on classroom implementation.

The AACTE committee (2008) described this complex interaction “as most evident whenever a new educational technology suddenly forces teachers to confront basic educational issues and reconstruct the dynamic equilibrium among all three elements” (p. 18). The Reading 3D program requires a handheld form of technology to assess students. Whether teachers were ready for this change or not, they were forced to confront this issue and analyze their perspectives on early literacy assessments.

**Definition of Terms**

**mCLASS®: Reading 3D** is a key program to understand in this study. According to wirelessgeneration.com (2010), “mCLASS®: Reading 3D is an innovative approach to literacy for K-5 students that balances the assessment of Foundations Skills with Text, Reading and Comprehension (TRC) diagnostics, giving a complete picture of a student’s reading development”. Essentially Reading 3D uses multiple formative assessments electronically in order to isolate skills and ensure mastery. Because these assessments are taken electronically, the analysis from the assessment data are available to the teacher instantaneously by accessing their data on a webserver.
Formative assessments use observational or diagnostic measures to provide detailed information about a student’s progress. Formative assessments provide teachers with frequent data regarding the growth and development of students. The purpose of this data is to allow teachers to plan appropriate differentiated small group instruction that will meet the needs of each student. Collecting data for formative types of assessment can be done in a variety of ways. According to Wang (2008), “Formative assessments play an important role in both the traditional learning environment and the e-Learning environment” (p. 1249). Traditionally, this has been a paper-pencil type of data collection. However, wireless generation offers a way to collect this data electronically, which speeds up the delivery of that data analysis for each child. For this study, formative assessment, also called progress monitoring is defined as, “a probe used between benchmarks to target specific content areas for remediation” (Reaves & Sullivan, 2010, p. 38).

Technology is generically defined as “tools created by human knowledge on how to combine resources to produce desired products, to solve problems, fulfill needs, or satisfy wants” (AACTE, 2008, p. 5). However, in this case, the technology that is being used for the Reading 3D program is specific to wireless generation specs. Resnick and Bergear (2010) described this technology as a “platform that makes it easy for schools and teachers to manage the assessment process and that puts at teachers fingertips, the insights and actions that should follow from assessment data” (p. 3). There are a variety of mobile devices that have been recommended at different prices. In this perceptual study, all participants use the PlaidLet computer to collect this diagnostic literacy assessment data.
The **PlaidLet** is a mini laptop computer made by DakTech. It has a touch screen and is used to collect data during benchmarking and progress monitoring. When the teacher is not collecting this anecdotal data, the PlaidLet could be used as a regular mini laptop computer in the classroom. As a result, the PlaidLet is used to collect the data, as well as provide “access to results immediately following assessments” (Reaves & Berger, 2010, p. 28).

**Literacy** is hard to define and ever changing. It is a shifting target that will continue to change over time. What it meant to be literate a few decades ago no longer holds true today. Past definitions used included learning to read and sounding out words from traditional texts (AACTE, 2008). For the purpose of this study, literacy will be used as a broader term. In order to be literate in the 21st century, students must be able to successfully collaborate and communicate through various types of media. Literacy teachers will be expected to change with new technologies and be able to support a variety of resources in order to meet the needs of young aspiring readers (Clay, 2001). This means that teachers will also need to creatively consider how to best connect technology with research-based literacy practices, which will be assisted in understanding through the TPCK model.

The **Technological Pedagogical Content Knowledge (TPCK) model** is an equal combination of content, pedagogy, and technology knowledge. It is the knowledge of how, when, and why to use technology within the classroom. This is the conceptual framework that will guide the survey, interview protocol and data analysis portion of this study.
Chapter Summary

Preuss (2007) believed that perceptive data is often ignored in data driven decision-making because of the time that it takes to collect. However, its impact is as powerful as any other type of data in the analysis process. The purpose of this perceptual study is to understand how teachers perceive the role of technology in the implementation of mCLASS®: Reading 3D. This chapter has provided the background of the problem as well as the role of technology in education. In addition, the conceptual framework to guide this study was presented.

In the next chapter, numerous streams of research will be explored to help give readers a better understanding of this study. I will explore in further detail the conceptual framework that will primarily guide this study; technological pedagogical content knowledge model. I will also explore implementation and perceptual studies as well as current literature on technology-based early literacy assessments will be reviewed.
Chapter 2

Review of Literature

In chapter one, it was stated that the purpose of this study was to understand how teachers perceive program implementation and the role of technology in the reading assessment program called mCLASS: Reading 3D.

The literature reviewed throughout this chapter will begin with the conceptual framework that was used to analyze the data that was collected throughout this study; technological pedagogical content knowledge (TPCK). In addition to this framework, the literature discussed in this chapter will include implementation studies, perceptual behavior, and early literacy. I will also identify common themes throughout the literature about the use of technology in early literacy assessments.

Conceptual Framework

Although technological applications began in the early 20th century, educational technology research and theory did not begin until the 1960’s (Ross, Sullivan, & Tennyson, 1992). The technological pedagogical content knowledge (TPCK) is a framework for teacher knowledge of technology integration. It builds on Shulman's (1986) construct of pedagogical content knowledge (PCK) to include technology knowledge. The TPCK framework is a complex interaction among three bodies of knowledge: content, pedagogy, and technology. See Figure 1 (http://tpack.org/).
The AACTE (2008) believed, “While the acquisition of content knowledge and pedagogical knowledge are critically important to the preparation of K-6 literacy teachers, the knowledge of how, when and why to use technology effectively in teaching literacy seems just as relevant for today’s teachers” (p. 61). In order to fully understand this framework, it is essential to know that each component is equally important as well as the interactions among the following categories: pedagogical content knowledge (PCK), technological content knowledge (TCK), technological pedagogical knowledge (TPK), and technological pedagogical content knowledge (TPCK).

Pedagogical content knowledge is consistent with Shulman’s idea of knowledge. The AACTE Committee (2008) shared that, “PCK covers the core business of teaching, learning,
curriculum, assessment, and reporting, such as the conditions that promote learning and the links among curriculum, assessment, and pedagogy” (p. 14). PCK offers the flexibility in pedagogical decision making in order to educate children in a way that will most impact them. PCK transforms subject matter into appropriate teaching strategies that students can relate to, understand, learn, and retain.

Technological content knowledge is “an understanding of the manner in which technology and content influence and constrain one another” (AACTE, 2008, p. 26). Within this study, this is an important component because the purpose of this study is to see how the teachers’ perceive the use of technology and how it has impacted the use of their new assessment program.

The full TPCK model will be used in this study because it goes beyond the previous three components. TPCK is an understanding that develops from using all of the content, pedagogy, and technology components. This is different than just having knowledge of the components individually (AACTE, 2008). This model allowed me to deeply analyze the data to get a deeper understanding of the perceptions of teachers.

We argue that TPCK is the basis of effective teaching with technology and requires an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of students’ prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on
existing knowledge and to develop new epistemologies or strengthen old ones.

(AACTE, 2008, p. 17)

Therefore, teachers’ perceptions of how students learn were an important finding in this study. The TPCK model also helped to understand the teachers’ perspective and make sense of the data collected.

The AACTE (2008) explained, “When technology is added to the educational environment, teachers must consider (1) how technology can be applied to enhance learning, (2) how use of technology change what is learned, and (3) how technology can be used to enrich the evidence of student learning” (p. 245). It is through this lens that I sought to understand teachers’ perceptions of the impact that technology in Reading 3D has had on classroom implementation. These teachers work in a social context; they were raised to understand their profession in a social context; and the goal was to explore and share how a state imposed program such as Reading 3D was impacted by that context.

**Implementation Research**

Educators constantly search for ways to improve instruction and to make the environment better for students. Grammatikopoulos, Tsigillis, and Koustelios (2007) believed a “programme’s effectiveness is highly influenced from the programme implementation” (p. 107). Program implementation studies help to identify what works and what does not. Gamse, Millsap, & Goodson (2002) justified, “For more than three decades, researchers have catalogued, described, and analyzed educational program implementation” (p. 146). Implementation studies are valued as useful information and, according to Klein
and Sorra (1996), are considered effective depending on the uniformity and quality of the use of a specific program within the entire organization. Of course, “it is not enough simply to ‘implement’; one must choose the right implementation plan. But then, by the same logic, one must know the right way to implement the implementation plan” (Pressman & Wildavsky, 1984, p. 166).

**Purpose of Implementation Studies**

Many researchers agreed that educators should not assume that just because a program is adopted, it would be implemented as intended (Desimone, 2002; Klein & Sorra, 1996; Mills, et al., 2000). Educators adopt programs and without further research, assume that it will yield positive results. Klein and Sorra (1996) echoed, “implementation is the critical gateway between the decision to adopt the innovation and the routine use of the innovation within an organization” (p. 1057). In order to yield expected results, implementers must ensure that the program has been implemented with fidelity. Fidelity of implementation is described as the comparison between the programs as intended with its actual use (Mills & Ragan, 2000).

Patton (2002) believed, “it is important to know the extent to which a program is effective after it is fully implemented, but to answer that question it is important to learn the extent to which the program was actually implemented” (p. 161). Most often, studying the implementation of educational programs offers valuable information regarding the influence of programs. In a program, “the implementation part is where the real action occurs” (Grammatikopoulos et al., 2005, p. 107). Monitoring these programs after implementation
can also provide valuable information about the targeted population, program activities, and the overall validity and success of the program.

Educators often adopt programs and are disappointed with the results and assume the program was flawed. However, it may simply be the implementation process that was flawed. Pressman and Wildavsky (1984) believed that “implementation and evaluation are the opposite sides of the same coin, implementation providing the experience that evaluation interrogates and evaluation providing the intelligence to make sense out of what is happening” (p. xv). Organizations often find that the reason for inability to achieve results is dependent upon implementation of the program rather than the innovation of the program (Klein & Sorra, 1996). There are three possible established benchmarks that reflect implementation of a program; partial, moderate, and full (Desimone, 2002). Many studies use benchmarks to set targets for successful implementation. Some implementation studies established their own empirical benchmarks (Berends, 2000). Desimone (2002) believed that an effective implementation was not always a defined standard. However, he went on to share that researchers have given full implementation a meaningful definition. These established benchmarks give researchers more details about whether the program was implemented with fidelity or with failure.

Implementation Failure

Klein & Sorra (1996) believed that when employees use the program less than designed, implementation failure occurs. In order to be proactive against implementation
failure, it is essential for an organization to understand the delicacies of implementation studies; too much or too little focus on implementation can cause implementation failure.

Researchers cautioned that once implementation is started, failure to monitor and describe the process could result in useless results (Patton, 2002; Preuss, 2007). In addition, failure to monitor the program will enable teachers to implement with convenience rather than fidelity.

Spillane, Resier, and Reimer (2002) also believed, “some explanations for implementation failure focus on the inability of principals to formulate clear policy outcomes or to adequately supervise the implementation of their goals” (p. 390). Therefore, principals must have a clear plan on how to prepare for the monitoring of the implementation. Even with a clear plan, principals must be careful to follow it. Often times, managerial types of duties threaten to interrupt the original plan of implementation. Preuss (2007) suggested that, “if there is a staff member or program in need of immediate assistance, run and provide the necessary assistance. But then learn from the experience and reflect upon its cause and seek to remove its roots in order to eliminate or reduce the possibility of its happening again” (p. 11).

Although it is essential to focus on implementation, too strong of a focus appears to restrict teacher autonomy and could easily have a negative impact inside schools. Negative results could include decreased motivation and professionalism among teachers and misalignment between school and program goals (Rowan & Miller, 2011). Teachers need to understand the reasons for focusing on implementation while not feeling restricted.
Therefore, it is essential to create just the right climate for appropriate program implementation.

**Implementation Climate**

Klein and Sorra (1996) believed that the stronger an organization’s implementation climate, the more likely the program will experience success. Therefore, examining the organization’s climate before program implementation and then supporting these needs is a way to prepare for program success. Klein & Sorra (1996) described a solid implementation climate as one that “fosters innovation use by (a) ensuring employee skill in innovation use, (b) providing incentives for innovation use and disincentives for innovation avoidance, and (c) removing obstacles to innovation use” (p. 1060). In order to ensure employee skill, the organization must be proactive in numerous ways. Appropriate professional development should be provided to all stakeholders and any barriers that exist should be removed before the implementation begins.

Klein and Sorra (1996) also understood, “An organization’s climate for the implementation of a given innovation refers to targeted employees’ shared summary perceptions of the extent to which their use of a specific innovation is rewarded, supported, and expected within their organization” (p. 1060). Investigating teachers’ perceptions will allow the organization to see through the eyes of their employees if the environment is suitable to adopt a program that will yield a successful implementation. When a proper climate is in place, then it is permissible to evaluate the actual implementation.
**Implementation Evaluation**

Educators must implement the right program to improve student achievement. Pressman and Wildavsky (1984) believed that “evaluation must also allow future implementation process to learn from errors” (p. 182). When evaluating program implementation, the implementer should assess whether the program is serving the appropriate population or if its service delivery is consistent with the program’s expectations (Rossi, Lipsey, & Freeman, 2004). To increase the validation of implementation studies, the Evaluation Scale of Educational Programme Implementation (ESEPI) was developed with six factors: training, educational material, administration, facilities, relationships, and educational procedure (Grammatikopoulos et al., 2005). The purpose of this instrument is to validate and enhance the effectiveness and accountability of program evaluation.

Gathering descriptive information about a program is another way to evaluate program implementation. According to Patton (2002), this information could include, “inputs, activities, processes, and structures” (p. 161). Although deviations from program protocol are common, it is important to understand why these adjustments have been made and what impact these deviations have had on program outcomes. Pressman & Wildavasky (1984) believed that, “In order for evaluation to be effective in its expanding domain—to be of use during implementation—it must be aimed at generating data that can be used to improve the implementation process” (p. 182).

Unfortunately, all too often, programs are selected and implemented in the school settings with little regard to research. Regrettably, “instances of how research has informed
decision-making or improved schooling are relatively rare” (Fusarelli, 2008, p. 180).

Although this could be considered disastrous, Lipsky (2010) explained the reasoning behind this problem by stating,

Not only is reliable information costly and difficult to obtain but for street-level bureaucrats high case loads, episodic encounters, and the constant press of decisions force them to act without even being able to consider whether an investment in searching for more information would be profitable. (p. 29)

Researchers credit the lack of research in decision making to other varying factors, including; the lack of resources, high case loads, managerial duties, overwhelming paperwork and the need to make hasty decisions (Fusarelli, 2008; Lipsky, 2010).

“Decision-making and program adoption in education is shaped by and often determined by ease of use, good marketing, lack of threat to current practice, … rather than research-based evidence of program effectiveness” (Fusarelli, 2008, p. 185). As a result of the educators’ seemingly limited regard to research, it is important to also explore the perceptions of teachers to report to administrators who are implementing this program in the future.

**Perceptual Research**

The theory of perception claims that people act according to how they understand themselves within a situation (Combs, Avila, & Purkey, 1978). Perception is what we “know consciously as what is and what happens around us, to us, and inside of us” (Powers, 1973, p. 35). Perceptual theory has been adapted numerous times to fit with education and include
perceptual traditions and behaviors based on perceptions. Secondary to the TPCK framework, these elements of perception will add to the understanding of this study.

**Perceptual Tradition**

The perceptual tradition tries to understand human behavior through the eyes of the individual. According to Purkey (1996), this tradition also tried to, “explain why people do the things they do by postulating that human behavior is determined by, and pertinent to, the phenomenal field of the experiencing person at the moment of acting” (p. 21). Actions are based on how an individual perceives the world at that very moment.

Purkey and Schmidt (1987) outlined 14 basic assumptions of the perceptual tradition:

1. There may be a preexistent reality, but an individual can only know that part which comprises his or her perceptual world, the world of awareness.
2. Perceptions at any given moment exist at countless levels of awareness, from the vaguest to the sharpest.
3. Because people are limited in what they can perceive, they are highly selective in what they choose to perceive.
4. All experiences are phenomenal in character: The fact that two individuals share the same physical environment does not mean that they will have the same experiences.
5. What individuals choose to perceive is determined by past experiences as mediated by present purposes, perceptions, and expectations.
6. Individuals tend to perceive only that which is relevant to their purposes and make their choices accordingly.
7. Choices are determined by perceptions, not facts. How a person behaves is a function of his or her perceptual field at the moment of acting.

8. No perception can ever be fully shared or totally communicated because it is embedded in the life of the individual.

9. ‘Phenomenal absolutism’ means that people tend to assume that other observers perceive as they do. If others perceive differently, it is often thought to be because others are mistaken or because they lie.

10. The perceptual field, including the perceived self, is internally organized and personally meaningful. When this organization and meaning are threatened, emotional problems are likely to result.

11. Communication depends on the process of acquiring greater mutual understanding of one another’s phenomenal fields.

12. People not only perceive the world of the present but they also reflect on past experiences and imagine future ones to guide their behavior.

13. Beliefs can and do create their own social reality. People respond with feelings not to reality’ but to their perceptions of reality.

14. Reality can exist for an individual only when he or she is conscious of it and has some relationship with it. (p. 30)

Based on these assumptions, perceptions matter more than reality because a person’s behavior is based solely on what they believe to be true.
Behavior Based on Perceptions

Perception is a primary component in human behavior (Purkey and Schmidt, 1987) and people act according to their personal reality (Rogers, 1952).

Perceptions serve as a reference point for behavior. They influence the memories people use to understand the present and anticipate the future. In addition, perceptions affect the possibilities that people can imagine and the goals that they are willing to work for. Thus, any change in perceptions alters one’s view of the past, present, future, and the imaginable. (Purkey & Novak, 1996, p. 23)

Perceptions affect how people understand and react to situations. Perceptions determine behaviors. Johnson (2004) believed that perception was related to, “a person’s cognitive ability to, among other things, reason, form concepts, and solve problems” (p. 42). This study sought to understand teachers’ perceptions with regard to the implementation of mCLASS®: Reading 3D.

Early Literacy

There is extensive research on literacy development in young children (e.g. Clay, 2001; IRA & NAEYC, 1998; National Research Council, 1998; Neuman & Dickinson, 2001; Shanahan, 2003; Yaden, Rowe, & MacGillivary 1999). The National Reading Panel (2000) was assembled to bring clarity to many research-based studies on reading instruction. However, instead of solving some of these issues, many remain unresolved. Described below are some of these elements of early literacy that are needed for success in beginning reading.
Elements of Beginning Reading

After a synthesis of scientifically based research studies, the National Reading Panel (NRP) concluded that the five core elements of effective reading instruction are phonics, phonemic awareness, fluency, comprehension, and vocabulary (National Institute of Child Health and Human Development - NICHD, 2000). This varied slightly from research studies that determined the big ideas of reading in early literacy as phonemic awareness, alphabetic principle, accuracy and fluency, comprehension, and vocabulary (Barone et al., 2005; National Research Council, 1998; Reading Resource, 2011; Sadao & Robinson, 2010). See Table 1 on page 27.

**Phonics.** Phonics is a reading approach that is based on the sounds of letters, clusters of letters, and syllables. Hammill and Swanson (2006) described the goal of phonics as teaching, “children to read and pronounce words by learning the phonetic value of letters and groups of letters” (p. 17). Although, the National Reading Panel (NRP) concluded that “systematic phonics instruction enhances children’s success in learning to read and … is significantly more effective than instruction that teaches little or no phonics” (National Reading Panel, 2000, p. 9), there are other critics that have an alternative interpretation of the impact of phonics instruction (Garan, 2002; Yatvin, 2000).

**Phonemic awareness.** The National Reading Panel (2000) advertised that there was scientific evidence that teaching children to maneuver sounds helps them learn to read. Phonemic awareness is the term used when referring to the ability to hear and maneuver sounds in words. This element supports word recognition, and fluency. A study completed
by Fitzgerald, Amendum, and Guthrie (2008) confirmed that phonological awareness is a critical skill for learning how to read.

**Alphabetic principle.** Alphabetic principle is when a child understands that letters represent speech sounds. This is often a difficult system to learn because of the number of sounds and letters that can be interchangeable. Many researchers (Barone et al., 2005; National Research Council, 1998; Reading Resource, 2011; Sadao & Robinson, 2010) believed that Alphabetic Principle is a big idea in early reading; however some studies emphasize this topic more than others. For example, in the NRP (2000) report, alphabetic principle was defined within sections of phonemic awareness and phonics instead of as a separate element. Hammill and Swanson (2006) believed that, “lessons in phonics usually are carefully structured, highly sequenced, and firmly fixed on the alphabetic principle” (p. 17). The better children understand that more than one letter can represent a sound, the more automaticity they will develop.

**Fluency.** Fluency is the ability to read text accurately and quickly and with appropriate expression or prosody. Fluent readers read as if they were speaking (Samuels & Farstrup, 2006). The NRP (2000) defined fluency as speed, accuracy, and appropriate expression. They also reported that fluency is a critical part for competent readers. Some researchers said that in order to increase fluency, a child can engage in repeated reading. However, a study conducted by Hiebert and Fisher (2005) argued that there was no significant difference on the fluency outcome of students who engaged in repeated reading.
**Vocabulary.** Vocabulary refers to the words we know, understand, and use to communicate. Most researchers agree, the more words a reader can identify with correct meaning, the easier it will be for a student to read and understand what they read (Barone et al., 2005; McNamara, 2007; National Reading Panel, 2000; National Research Council, 1998; Reading Resource, 2011; Sadao & Robinson, 2010). There are two types of vocabularies: “receptive vocabulary is the vocabulary that we can understand when it is presented to us in text or as we listen to other speak, while productive vocabulary is that vocabulary we use in writing or when speaking others” (National Reading Panel, 2000, pp. 4-15). Within this study, receptive vocabulary is generally what is referred to when using the term vocabulary, but productive vocabulary also comes into this study in the writing component of this program.

**Comprehension.** Reading comprehension is the ultimate purpose for reading. McNamara’s (2007) research stated, “reading comprehension is a product of complex interactions between the properties of the text and what readers bring to the reading situation” (p. 11). Successful readers make meaning from what they are reading. Reading comprehension is the fundamental goal of reading. As a result, phonemic awareness, alphabetic principle, and oral reading fluency, are given less attention (Reading Resource, 2011). All components of reading are important and must be taught in early literacy classrooms.
Table 1

The Elements of Beginning Reading

<table>
<thead>
<tr>
<th>Element</th>
<th>Definition</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phonics</td>
<td>Reading based on the sounds of letters, clusters of letters, syllables, sounds, and symbol correspondence.</td>
<td>Enhances children’s success in decoding and word recognition.</td>
</tr>
<tr>
<td>Phonemic Awareness</td>
<td>Ability to hear and maneuver individual sounds in words</td>
<td>Relates to word recognition and fluency. Strong phonemic awareness is related to more fluent readers.</td>
</tr>
<tr>
<td>Alphabetic Principle</td>
<td>Ability to understand that letters make speech sounds</td>
<td>Helps to understand the code of language.</td>
</tr>
<tr>
<td>Fluency</td>
<td>Ability to read text accurately and quickly with proper expression</td>
<td>Fluency is related to confident readers.</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>Words we know and use to communicate meaning</td>
<td>Strong relationship between vocabulary knowledge and comprehension.</td>
</tr>
<tr>
<td>Comprehension</td>
<td>Readers make meaning from what they read</td>
<td>The ultimate purpose of reading.</td>
</tr>
</tbody>
</table>

**DIBELS**

Researchers at the University of Oregon developed DIBELS. Manzo (2005) explained that, “DIBELS has become a catchphrase in the schoolhouse and the statehouse as officials look to test data to inform instruction, to identify children at risk of failure in reading, and to hold schools accountable for student achievement” (p. 1). The mCLASS®: Reading 3D foundation skills are partially based on DIBELS assessments, which are quick
measures for assessing early literacy skills from kindergarten through sixth grade. They are intended to be short assessments that are administered regularly to observe the growth of early literacy skills (Center on Teaching and Learning, 2011). See Table 2 on the following page.

DIBELS assessments are used across the country because of federal support for the program. There have been debates on the legitimacy of DIBELS as an accurate indicator of risk and planning tool for educators. Manzo (2005) explained that DIBELS is a good assessment tool, but it does not give teachers clear answers for planning differentiated instruction. DIBELS may assess students at a level in which they cannot yet read the selections; therefore these assessments demonstrate floor effects (Fuchs, Fuchs, Hamlett, Walz, & Germann, 1993; Groce, 2009). Other researchers argued against the reliability of DIBELS assessments (Goffreda, Diperna, & Pedersen, 2009; Goodman et al., 2006; Hintze, Ryan, & Stoner, 2003; Nelson, 2008; Pressley, 2006; Roehrig, Yaacov, Nettles, Hudson, & Torgesen, 2006; Samuels, 2007). There has also been a call for more studies of DIBELS by researchers not connected to the assessments (Ardoin & Christ, 2009; Hintze et al., 2003).

The seven DIBELS “quick check” assessments predict where students are performing and provide instructional guidance for teachers. The quick check assessments include Initial Sound Fluency (ISF), Phoneme Segmentation Fluency (PSF), Letter Naming Fluency (LNF), Nonsense Word Fluency (NWF), Word Use Fluency (WUF), Oral Reading Fluency (ORF), and Retell Fluency (RTF). With the exception of LNF, each of the quick check assessments
aligns with the elements in beginning reading. Although LNF does not directly align with one of the elements in beginning reading, it is documented as an accurate predictor of risk.

Table 2

DIBELS component of mCLASS®: Reading 3D

<table>
<thead>
<tr>
<th>DIBELS</th>
<th>Definition</th>
<th>Administered</th>
<th>Alignment of Element</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISF</td>
<td>Ability to recognize beginning sounds</td>
<td>Kindergarten</td>
<td>Phonemic Awareness</td>
</tr>
<tr>
<td>PSF</td>
<td>Ability to segment two-to four-phoneme words into individual phonemes</td>
<td>Kindergarten, Grade 1</td>
<td>Phonemic Awareness</td>
</tr>
<tr>
<td>LNF</td>
<td>Ability to recognize and name letters of the alphabet fluently and with automaticity</td>
<td>Kindergarten, Grade 1</td>
<td>NONE – (Indicator of risk)</td>
</tr>
<tr>
<td>NWF</td>
<td>Ability to identify and blend letter sounds</td>
<td>Kindergarten, Grades 1-2</td>
<td>Alphabetic Principle, Phonics</td>
</tr>
<tr>
<td>WUF</td>
<td>Assesses vocabulary and expressive language knowledge</td>
<td>Kindergarten, Grades 1-3</td>
<td>Vocabulary</td>
</tr>
<tr>
<td>ORF</td>
<td>Ability to accurately and fluently read grade-level connected text</td>
<td>Grades 1-3</td>
<td>Accuracy and Fluency, and Comprehension</td>
</tr>
<tr>
<td>RTF</td>
<td>Ability to comprehend connected text</td>
<td>Grades 1-6</td>
<td>Comprehension</td>
</tr>
</tbody>
</table>

**Text, Reading, and Comprehension (TRC)**

In conjunction with DIBELS, mCLASS®: Reading 3D uses a certain type of reading
text level assessment called Text, Reading, and Comprehension (TRC). TRC assessments also parallel the concepts in accuracy and fluency, comprehension, and vocabulary. Many researchers suggest that oral reading fluency has a strong relationship with students’ overall reading competence (Fuchs et al., 2001; Glasgow & Farrell, 2007; McGlinchey & Hixson, 2004; Sadao & Robinson, 2010).

McNamara (2007) showed in her research that “one must diagnose an individual reader’s deficits, because there are multiple reasons why a student may struggle to read” (p. 115). Wireless Generation (2008) assists educators in this assessment process by offering mCLASS®: Reading 3D on an electronic device. This program instantly provides effective differentiated reading lessons and web-based reporting. “Reading lessons provide a social context in which teachers and students meet and closely interact” (Amendum, Li, Hall, Fitzgerald, Creamer, Head-Reeves, & Hollingsworth, 2009, p. 120).

Breck (2006) suggested that technology can radically revise assessments and that “the answer lies in bringing assessments closer to the ultimate goal of learning” (p. 295). Reading 3D requires continuous technology-based assessments using three benchmark assessments per year. Benchmarking “is the process of comparing student assessment results with other measures of student assessment data” (Preuss, 2007, p. 46). During these assessments, each student is assessed using DIBELS and TRC. The benchmark reports provide valuable information to the teacher regarding how often each student should be progress monitored in order to become academically proficient. A formative assessment is identified as the process between teacher and student that responds to learning (Risko & Walker-Dollhouse, 2010).
These assessments are meant to adapt teaching and are the preferred assessment for guiding instruction.

**Using Technology in Early Literacy Assessments**

Trunacle (2010) explained, “The fast pace of technological change has caused us to reevaluate how we educate students to meet the needs of the changed workplace” (p. 45). Although this study is in response to North Carolina Governor Beverly Purdue spending 10 million dollars for an educational program called Mobile Class (mCLASS): Reading 3D, other technology-based literacy assessment programs were also reviewed throughout the literature.

mCLASS®: Reading 3D is an innovative K-5 literacy based program that uses mobile technology as a way of collecting and analyzing student data. There are similar technology-based assessment programs marketed to achieve the same goals. For example, many North Carolina schools have selected Pearson’s formative assessment solution, AIMS web, as their solution to Responsiveness to Instruction (RtI). Gaither (2008) described AIMS web as a “curriculum-based measure (CBM). CBMs are brief assessments of academic skills that provide a general outcome measure which is reliable, valid, and sensitive to growth” (p. 15). Like mCLASS®: Reading 3D, AIMS web is also a benchmark and progress-monitoring system based on direct, frequent, and continuous student assessment.

Doe (2006) stated there has been an “amazing growth in the number and use of Web-based assessments and is being spurred by their enormous advantages” (p. 18). Therefore, this study also contains reviews on electronic assessment programs such as Formative
Assessment Instrumentation and Procedures for Reading (FAIP-R), Plato: EduTest, Curriculum Based Management (CBM), Accelerated Reader (AR), and STAR Assessment. Although some of these programs are endorsed by the North Carolina Department of Public Instruction and provide reports that may help determine which students are on the pathway to proficiency for the North Carolina End Of Grade assessments, the mCLASS®: Reading 3D is unique in the program design to provide instructional guidance based on individual assessments.

**Common Themes Found in the Research**

After reviewing the research relating to technology and literacy assessments, several common themes emerged including immediate feedback to students, progress monitoring, cost effectiveness, changes in education, and common cautions. These themes will be discussed in further detail throughout this section.

**Immediate feedback.** In the literature, there is an emphasis on the importance of immediate feedback to students. Song (2007) believed that using handheld computers ensures that “feedback can be triggered after submission of completed quizzes and assessments” (p. 40). Although he questioned the consequences of handheld technology, he agreed that the strength in the use of technology is that it provides response and feedback immediately to students. Risko (2010) added that, “assessments can transform instruction by providing timely information that captures students’ strengths, needs, and specific instructional history” (p. 420). Balajthy (2007) asserted that technology-based programs provide feedback by assigning each question based on the previous question. This option
could never be considered in paper-pencil tests and is one of the many benefits of utilizing technology in formative types of assessments.

mCLASS®: Reading 3D is designed to be formative in nature. The data recorded on the handheld are available to administrators and instructional specialists immediately after the computer is synced with mclasshome.com. This is an efficient way to collect accurate data. It also helps with data driven decision making and determining small group activities designed to meet the individual skill needs of students. This program is designed to encompass three benchmark assessments that are to guide instruction as well as identify individual students who need progress monitoring.

**Progress monitoring.** Progress monitoring is defined as assessment in regular intervals in order to predict growth of each student and assess the appropriateness and effectiveness of an instructional program. For students who are not considered at grade level, North Carolina standards require that progress monitoring occur every ten days, after nine days of instruction. Researchers (Ardoin & Christ, 2009; Balajthy, 2007; Hintze, Christ, & Methe, 2006; Wang, 2010) agreed that simply meeting face to face with a student could make a difference in a child’s performance. Progress monitoring “allows the examiner to assess the reading progress of a student twice a week for 10 to 14 weeks. Student performance data are then graphed and decisions are indexed to the amount of growth observed over time” (Hintz et al., 2006, p. 52). Hintze et al., (2006) agreed that the technology provides a more effective way to monitor progress. As a result, increased student performance is more likely to occur.
Ardoin and Christ (2009) expressed thoughts of progress monitoring by stating, “10 weeks of twice-weekly progress monitoring data is more data points than is normally collected and is essential before making instructional decisions” (p. 268). These researchers caution others that while progress monitoring is important, educators should consider grade appropriate selections to ensure that they are consistent. McNamara (2007) believed it was important to assess the child to see if they are at academic risk. Once identified, progress monitoring should be implemented to ensure student success. Technology often makes it easier to ensure validity and consistency.

**Cost effectiveness.** In a world of limited financial resources, cost effective assessments hold a unique quality (Ardoin & Christ, 2009). Clarke-Midura and Dede (2010) believed, “Virtual assessments can be more cost effective as well as easier to administer and score for schools, and it can address task and occasion sampling variability through design” (p. 317).

Typically, summative assessments such as End of Grade assessments have been considered more cost-effective. Clarke-Midura & Dede (2010) explained that within an accountability realm, “multiple-choice tests have been the favored choice because they have satisfied psychometric criteria, are more cost effective, and are easier to scale” (p. 311). However, these studies showed that in the twenty-first century there are many other electronic options that are cost effective and support more formative types of assessments.

**Revolutionized education.** Using technology in early literacy assessments could revolutionize education. Wang (2008) shared that with technology, there is no real time or
space constraint. It allows for spontaneity and opportunities for students to learn. Clarke-Midura and Dede (2010) stated that virtual performance based assessments allow for more triangulation of student accomplishment. It increases engagement and allows for more authentic inquiry. MacDonald (2006) believed that mobile technology allows for better documentation of observations. He went on to discuss how technology helps students better meet learning objectives. Researchers agreed that use of technology in assessments help students become more motivated and more apt to show true ability on assessments.

**Cautions.** Although researchers agreed that formative assessments are essential for student growth, there are cautions to some reading assessment programs. There are flaws in some of the base programs and they should be researched thoroughly before use. Ardoin & Christ (2009) explained that, “Initially the multiple forms that made up CBM-R passage sets for progress monitoring were developed by randomly selecting passages from students curricula. This method, however, was discovered to be flawed because of considerable variability in the difficulty of text within curricula” (p. 267). Furthermore, Song (2007) also argued that technology has made face-to-face teaching and learning more silent and teacher controlled.

**Implications**

North Carolina elementary schools performing below 55.9% were selected to implement mCLASS®: Reading 3D. As the principal of an elementary school that has been chosen as a pilot school for this program, understanding the pros and cons of this program and similar programs is essential. Although it is unclear what research was used to select this
program for the state, this study of similar programs creates numerous suggestions for educators.

Wang (2008) suggested that more research is needed on appropriate design of web-based formative assessment feedback. This is also relevant in mCLASS®: Reading 3D schools because of the reports that are generated. It is important to understand and support the design behind such reports. For example, upon examining a parent report from mCLASS®: Reading 3D, it showed information that was not congruent with countywide expectations. According to Reading 3D Home School Connection Reports (see Appendix F for a sample report), a first grader should read at least a level C to be considered proficient, while countywide expectations clearly state that a first grader must be a level F at the beginning of the year assessment. This type of reporting is contradictory and must be addressed in order to create reliability within the program.

Future studies should also examine reliability of decisions based on progress monitoring (Ardoin & Christ, 2009) which is supported in the design of each assessment. The researchers stated that the “results of the current study suggest that future studies should examine the reliability and accuracy of decisions regarding students’ response to instruction as a function of the difficulty of passages used to monitor progress” (p. 279).

Researchers (Clarke-Midura & Dede, 2010; Wang, 2008) agreed that teachers who use a variety of strategies to gather data on students allow for a more valid picture to guide classroom instruction. Although mCLASS®: Reading 3D appears to be an appropriate program for gathering needed individualized formative assessment data, it is important to
gather additional assessment data, such as from observations and conversations with all stakeholders, and select an appropriate conceptual framework through which to analyze the data.

**Chapter Summary**

In conclusion, the electronic formative assessment programs discussed in this chapter are a way to track students’ data instantly to guide early literacy instruction. Durkin (1978-79) stated in her revolutionary work decades ago that teachers should not replace teaching with testing. However, in Twenty-First Century learning, it seems as though testing is crucial to help guide teaching. Doe (2006) believed that technology in early literacy assessments could make the life and job of a teacher much simpler along with supporting a diverse population of students. Balajthy (2007) summed it up nicely when he said,

> Even under the best conditions, initial startup of any technology-based educational system will be onerous, as teachers learn software operation, work out inevitable bugs, and integrate the new data and their regular instruction. When properly implemented, however, technology can ease teachers’ assessment burdens and increase efficiency and effectiveness. (p. 240)

The following chapter will outline the methodology and research design of this study, including the steps of the data collection process and participant selection, as well as participant descriptions.
Chapter 3

Methodology

As previously mentioned, the purpose of this study was to understand how teachers perceive program implementation and the role of technology in the reading assessment program called mCLASS®: Reading 3D. This qualitative perceptual study explored how teachers’ perceived the implementation process and how technology impacted the fidelity of the Reading 3D program.

The results of this study may assist educators with the knowledge of the impact that mobile technology has on early literacy assessments. A great deal of an educator’s budget must be utilized in order to make program implementation successful. In order to understand the previous research in this area, the literature review examined several literature streams including the Technological Pedagogical Content Knowledge model, utilizing technology in early literacy assessments, as well as implementation and perceptual studies.

This chapter will describe the research design that helped guide the research questions of this study. In addition, this design guided the participant selection, data collection, and data analysis methods. Within this chapter, I will also discuss the ethical considerations of the study and the preparations that were taken into consideration to address the possible limitations of the study.
Research Design

There are many opportunities for research in the field of education (Merriam, 1998). Qualitative research can be defined as “an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem. The researcher builds a complex, holistic picture, analyzes words, reports, detailed views of informants, and conducts the study in a natural setting” (Creswell, 2007, p. 15). Merriam (1998) went on to share that in contrast to quantitative research, “qualitative research can reveal how all the parts work together to form a whole. It is assumed that meaning is embedded in people’s experiences and that this meaning is mediated through the investigator’s own perceptions” (p. 6). With this in mind, I considered each teacher’s experience and perspective as a valuable part of the data collection in this study.

Qualitative research is a comprehensive approach to studying social phenomenon and includes a variety of approaches to select from based on the intent of the study (Bloomberg & Volpe, 2008). Educational researchers have refined qualitative research methods to investigate perceptions (Bogdan & Biklen, 1992; Eisner, 1991; Moustakas, 1990). Purkey (1996) understood perceptual tradition as a way to explain why individual act as they do in an exact moment. Actions are based on how an individual perceives the world at that very moment. This study used a qualitative, perceptual design because the purpose was to explain the perceptions of teachers as it relates to the impact of technology in the implementation of the Reading 3D program. The uniqueness of a perceptual study lies in the explanation of the
perception as well as the understanding for the perception. Throughout this study, I sought to gain understanding and meaning within the realm of a single rural North Carolina county.

In this study, I attempted to understand various aspects in the implementation of Reading 3D. This study provided an understanding of the link between technology and teacher perceptions of the implementation of Reading 3D. Although this study does not offer generalizability, describing Reading 3D as a much needed early literacy assessment program that provides appropriate interventions may also assist other schools that are looking for a research-based K-2 intervention program.

This perceptual study sought to discover teachers’ perspectives on how technology in the Reading 3D program impacted the implementation of the program in this school system. The underlying assumptions that drove this research were the sense of exploration and hope for discovery about the impact Reading 3D has on classroom instruction. I collected appropriate data in this perceptual study in order understand the implementation process in a rural county.

There are limitations to perceptual studies; only teachers’ perceptions were explored throughout this study. The perceptions of principals and other staff members conducting assessments were not examined, so the data gathered may be biased toward teacher perceptions and not representative of the entire implementation of the program.

**Research Questions**

Rossi, Lipsey, and Freeman (2004) believed program implementation studies to be two-fold. Implementation studies are used to decide if the program is reaching the intended
audience and is consistent with what is supposed to be accomplished. The purpose of implementing mCLASS®: Reading 3D is to establish a well-defined formative assessment to improve literacy skills to the target audience.

In order to evaluate the teachers’ perceptions of the implementation of this program, two research questions were identified:

1. What are the teachers’ perceptions of the implementation of the Reading 3D program?
2. For teachers implementing Reading 3D in grades K-3, what are their perceptions regarding the implementation process of Reading 3D as it relates to the role of technology?

In order to answer the research questions, this study reviewed data collected through surveys, documentation, and interviews to provide a deep understanding of the perceptions of selected teachers.

**Participant Selection**

Patton (2002) explained that stratified random sampling is essentially a sample within a sample. All K-3 teachers that implemented Reading 3D in the 2010-11 school year were invited to participate in a survey. However, the sampling for interviewing teachers in this study was stratified because I used online documentation to identify two groups of participants (described in greater detail below); in order to narrow down the sample size four teachers within each group were then selected to participate in an interview. For this study, I
selected participants through stratified random sampling in order to enhance the results of this study.

While this study has wider implications, this program is only available at the elementary level. In 2009-2010, the state of North Carolina piloted Reading 3D in 47 select schools. In August of 2010, the final evaluation report was presented to the North Carolina General Assembly, which resulted in additional school districts participating in Reading 3D. Due to budget constraints, there were a limited number of schools that participated in this program at the state’s expense. The state used EOG data from 2009-10 and mandated that any school that had a composite score of 55.9% or below participate in Reading 3D. See Appendix A for an explanation of a composite score.

According to wirelessgeneration.com (2008), a total of 483 schools or 36 percent of the elementary schools in North Carolina participated in the implementation of Reading 3D in 2010-11. There are four implementation elementary schools in the selected county; however, only three schools were selected for this study in order to protect the integrity of this study. I am currently employed at the fourth implementation site. In accordance with IRB with intent to protect the anonymity of participants of this study, I assigned pseudonyms to each school. One school, Blue Ridge Elementary, was required to participate in Reading 3D based on 2009-2010 EOG composite scores. Blue Ridge was in the first implementation cohort and began training in early September. Several months into the school year, two additional schools, Clear Brooke Elementary and Maugans Avenue Elementary, applied voluntarily and were accepted in the second and third cohorts for implementation. Clear
Brooke staff was trained in December 2010 while Maugans Avenue staff received training in January 2011. Both schools were able to implement the program during the middle of the year benchmark assessment. See Table 3 below.

### Table 3

**Site Information**

<table>
<thead>
<tr>
<th>School</th>
<th>Prior Position held by Researcher</th>
<th>Composite 2009-10</th>
<th>Years 2009-10</th>
<th>Current Demographics</th>
<th>Cohort</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue Ridge Elementary</td>
<td>Teacher</td>
<td>55.3%</td>
<td>2004-2007</td>
<td>63% Black</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>23% White</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7% Hispanic</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7% Other</td>
<td></td>
</tr>
<tr>
<td>Clear Brooke Elementary</td>
<td>Teacher</td>
<td>60.2%</td>
<td>2000-2004</td>
<td>53% White</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>31% Black</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12% Hispanic</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4% Other</td>
<td></td>
</tr>
<tr>
<td>Maugans Avenue Elementary</td>
<td>Asst. Principal and Principal</td>
<td>63.4%</td>
<td>2007-2009</td>
<td>47% White</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38% Black</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12% Hispanic</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3% Other</td>
<td></td>
</tr>
</tbody>
</table>

Importantly, I have been employed at all of the elementary schools within this county that are implementing this program. This will be considered a strength of the study because I am the collection agent who will analyze the data and try to make sense of the meaning behind participants’ responses.
Table 4

*Participant Selection*

<table>
<thead>
<tr>
<th>School</th>
<th>Cohort</th>
<th>Survey Participants</th>
<th>Agreed to Interview</th>
<th>Progress Monitoring with Fidelity</th>
<th>Selected For Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue Ridge Elementary Elementary</td>
<td>1</td>
<td>10</td>
<td>5</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Clear Brooke Elementary Elementary</td>
<td>2</td>
<td>11</td>
<td>6</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Maugans Avenue Elementary Elementary</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>26</td>
<td>14</td>
<td>10</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

*Data Collection*

Researchers recommended many common sources for data collection in qualitative research. Merriam (1998) stated that data is usually derived from interviews, field observations, and documents, while Yin (2003) recommended gathering data from the following: online documentation, archival records, interviews, direct observations, participant observations, and/or physical artifacts.

For this study, I collected data through surveys, online documentation, and interviews. Data was collected and stored electronically. I backed up the data in a password-protected file on a Mac book. As participants were selected, I assigned everyone an identifier and collected the data under their unique identification in order to maintain confidentiality. Once information was collected, I transcribed the data collected in interviews.
Surveys

A clear and simple survey yields sufficient and rich data through a few closed questions and a few precise open-ended questions (Edmonson & Irby, 2008). In order to formulate appropriate survey questions, I reviewed various studies, including dissertations, implementation studies, and literacy-based studies. After developing possible questions, I discussed with a literacy expert and drew upon my own experiences with this program to finalize the survey questions, including 10 checklist items and 8 open-ended questions regarding the implementation of Reading 3D.

Edmonson & Irby (2008) explained that, “The survey is long enough to gather important information on the topic; however, a follow-up interview may be necessary with some of the respondents for clarification purposes” (p. 72). The survey also asked participants whether or not they would be willing to participate in an interview.

There are limitations to administering surveys in a qualitative study. Unfortunately, you run the risk of losing the opportunity to dig deeper into a participants’ response when you only use a survey (Edmonson & Irby, 2008). That is why I also participated in eight one on one interviews. In addition you are unable to clarify to the participant the meaning of each question and the possibility of an invalid survey arises. Lastly, participants tend to elaborate more when talking than when writing.

I administered a paper/pencil survey at three elementary schools inviting any teacher who taught kindergarten, first, second, or third grade during the last school year to participate. Within this study, I met with 27 eligible staff members at their school and
explained the study to them, asking if they would be willing to take a 20 minute survey during the duration of this regularly scheduled staff meeting (see Appendix B). With a completion rate of 96%, twenty-six of the teachers from three schools agreed to participate. Although there were 10 participants from Blue Ridge, 11 from Clear Brooke, and 5 from Maugans Avenue Elementary, I will report the findings as one group of teachers from the same rural county. Within the survey, teachers were given an option to be anonymous and therefore I will not link survey information to a specific teacher. Twenty-five of the teachers were female, with only one male teacher participating, however, throughout this study, each teacher will be referred to with feminine pronouns in order to further protect anonymity. Most of the teachers in this survey have taught for more than six years and have a deep knowledge of previous literacy assessments and practices with which to compare Reading 3D. See Table 5 on the next page for a description of the survey participants.

At the end of the survey, participants were able to select whether or not they would be willing to participate in a one-on-one interview. Although there were 26 surveys received, only 14 stated that they would be willing to participate if selected. Five of these teachers were from Blue Ridge, six from Clear Brooke, and three from Maugans Avenue Elementary.
### Table 5

*Description from Survey Participants*

<table>
<thead>
<tr>
<th>Gender</th>
<th>25 Female</th>
<th>1 Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>4 Under 30</td>
<td>5 30-39</td>
</tr>
<tr>
<td></td>
<td>5 30-39</td>
<td>9 40-49</td>
</tr>
<tr>
<td>7 50-59</td>
<td>9 40-49</td>
<td>1 60+</td>
</tr>
<tr>
<td>Current Grade Level</td>
<td>8 K</td>
<td>5 2</td>
</tr>
<tr>
<td>8 1</td>
<td>5 3</td>
<td></td>
</tr>
<tr>
<td>Years Teaching in Current Grade Level</td>
<td>0 1</td>
<td>5 2</td>
</tr>
<tr>
<td>3 3</td>
<td>4 4</td>
<td></td>
</tr>
<tr>
<td>3 5</td>
<td>11 6+</td>
<td></td>
</tr>
<tr>
<td>Total Years Teaching Experience</td>
<td>1 0-2</td>
<td>4 3-5</td>
</tr>
<tr>
<td>7 6-10</td>
<td>14 11+</td>
<td></td>
</tr>
<tr>
<td>Please indicate type of early literacy assessments you administered prior to Reading 3D:</td>
<td>21 GCS Assessment</td>
<td>21 RR</td>
</tr>
<tr>
<td>5 DIBELS</td>
<td>21 DRA</td>
<td></td>
</tr>
<tr>
<td>21 Benchmark</td>
<td>5 ClassScape</td>
<td></td>
</tr>
<tr>
<td>Please indicate how much training time was provided to you for the use of Reading 3D assessment on the PlaidLet:</td>
<td>0 Less than 1 hour</td>
<td>5 1-3 hours</td>
</tr>
<tr>
<td>10 4-6hours</td>
<td>11 7+ hours</td>
<td></td>
</tr>
<tr>
<td>Please indicate how much training time was provided to you for the use of data analysis provided from mclasshome.com:</td>
<td>2 Less than 1 hour</td>
<td>14 1-3 hours</td>
</tr>
<tr>
<td>8 4-6hours</td>
<td>2 7+ hours</td>
<td></td>
</tr>
<tr>
<td>Please indicate below how often you use the activities included in mclasshome.com for reading instruction:</td>
<td>5 Daily</td>
<td>9 Weekly</td>
</tr>
<tr>
<td>8 Monthly</td>
<td>5 Rarely</td>
<td></td>
</tr>
<tr>
<td>0 Never</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Please indicate below how much time on average each week you spend discussing results of your electronic assessment results with others: (this may include your grade level team, other instructional planning teams, an instructional specialist, or your administrator)</td>
<td>12 Less than 1 hour</td>
<td>12 1-3 hours</td>
</tr>
<tr>
<td>12 1-3 hours</td>
<td>2 4-6 hours</td>
<td></td>
</tr>
<tr>
<td>0 7+ hours</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Online Documents

Patton (2002) believed that a researcher should negotiate access to important documents from the very beginning of a study. Therefore, I requested permission from the Assistant Superintendent and principals to view online documents. Official documents are readily available, but may be protected or private (Bogdan & Biklen, 2007). In this study, the online reports are password protected, but are available with district permission.

Hence, with permission from each principal, I examined each electronic document as officially trained by the developers of Reading 3D, Wireless Generation to discover which of the 14 willing participants were progress monitoring with fidelity (see Appendix C for sample reports). Ten participants appeared to progress monitor regularly, while four participants were not monitoring as often as intended. After stratifying the fourteen participants into these two groups, I purposefully narrowed the sample in order to study each participant deeper. Selecting four of the ten participants who progress monitored consistently along with all of the four participants who were not progress monitoring with consistency to participate in a one-on-one interview narrowed the sample size, which allowed me to dig deeper into each perception.

Patton (2002) explained that a possible limitation of document analysis is that they might be incomplete or inaccurate. Therefore, I reviewed documents with my personal expertise to analyze the online reports. Edmonson & Irby (2008) shared that “While documents alone are rarely sufficient to conduct a qualitative study they are excellent sources
of support data for other things such as interviews and observations” (p. 90). Therefore, document analysis was only one portion of this study.

**Interviews**

In order to formulate appropriate interview questions, I reviewed various studies, including dissertations, implementation studies, and literacy-based studies. After developing possible questions, I used my experience of implementing this program to adjust and adapt questions to better fit the purpose of this study (see Appendix D for Interview Protocol).

From these eight participants, four interviewees were from Blue Ridge, three from Clear Brooke, and one from Maugans Avenue. In order to stay within IRB strictures and given the small size of this district in which I am a principal, I have been extra careful at masking the identity of interview participants. As a result, I have given each interviewee an identifier and did not link them to a school site (see Table 6 for a description of these eight interviewees). The experience of participants ranged from six years of teaching to twenty-five years while the ages of participants ranged from under 30 to 59 years of age. Each of the eight interviews took place in the teacher’s classrooms and all respondents were asked the same questions during the interview, which lasted between 30-40 minutes. All of the interviews were audio recorded and transcribed by the researcher.
Table 6

Description of Interview Participants

<table>
<thead>
<tr>
<th>Participant</th>
<th>Current Grade Level</th>
<th>Age Range</th>
<th>Progress Monitor as intended</th>
<th>Which Assessments administered prior to Reading 3D</th>
<th>Number of hours of Training</th>
<th>How often activities are used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher 1</td>
<td>First</td>
<td>30-39</td>
<td>Yes</td>
<td>GCS, DRA</td>
<td>Plaidlet – 7+ Data – 1-3</td>
<td>Weekly</td>
</tr>
<tr>
<td>Teacher 2</td>
<td>Third</td>
<td>50-59</td>
<td>No</td>
<td>ClassScape</td>
<td>Plaidlet – 4-6 Data – 1-3</td>
<td>Weekly</td>
</tr>
<tr>
<td>Teacher 3</td>
<td>First</td>
<td>40-49</td>
<td>No</td>
<td>GCS, RR, DRA</td>
<td>Plaidlet – 4-6 Data – Less 1</td>
<td>Monthly</td>
</tr>
<tr>
<td>Teacher 4</td>
<td>Second</td>
<td>50-59</td>
<td>No</td>
<td>GCS, RR, DRA</td>
<td>Plaidlet – 4-6 Data – Less 1</td>
<td>Rarely</td>
</tr>
<tr>
<td>Teacher 5</td>
<td>Kinder</td>
<td>50-59</td>
<td>No</td>
<td>GCS, DIBELS, RR, DRA, Benchmark</td>
<td>Plaidlet – 4-6 Data – 4-6</td>
<td>Weekly</td>
</tr>
<tr>
<td>Teacher 6</td>
<td>Second</td>
<td>30-39</td>
<td>Yes</td>
<td>GCS, DIBELS, RR, DRA, Benchmark</td>
<td>Plaidlet – 1-3 Data – 1-3</td>
<td>Monthly</td>
</tr>
<tr>
<td>Teacher 7</td>
<td>Kinder</td>
<td>Under 30</td>
<td>Yes</td>
<td>GCS, DRA</td>
<td>Plaidlet – 7+ Data – 4-6</td>
<td>Weekly</td>
</tr>
<tr>
<td>Teacher 8</td>
<td>First</td>
<td>Under 30</td>
<td>Yes</td>
<td>GCS, RR, DRA</td>
<td>Plaidlet – 7+ Data – 4-6</td>
<td>Daily</td>
</tr>
</tbody>
</table>
All interview transcriptions were analyzed using a peer researcher as a check. Bogdan & Biklen (2007) believed that a researcher should not give up to easily because not every participant is correspondingly perceptive. Therefore, I limited the amount of suggestions given and adhered to the rule that a good interviewer should be a good listener and not a speaker during a scheduled interview (Creswell, 2007, Bogdan & Biklen, 2007).

**Data Analysis**

Merriam (1998) explained data analysis as, “the process of making sense out of the data. And making sense out of data involves consolidating, reducing, and interpreting what people have said and what the research has seen and read-it is the process of making meaning” (p. 178). Huberman and Miles (2002) stated that data analysis must be custom-built and revised. Data analysis is a multifaceted endeavor that involves looking at numerous aspects of the data, including the actual data along with inductive and deductive reasoning by me.

**Open Coding**

Coding data is a crucial step in interpreting data from this study. Coding “includes the constant comparison of phenomena, cases, concepts, and the formulation of questions” (Flick, 2003, p. 178). While coding, I followed research-based methods of trying various themes to develop categories that reflected the purpose of the study (Bogdan & Biklen, 2007; Huberman & Miles, 2002).

Formulating categories is largely an insightful progression, but it is also methodical and was informed by the purpose of this perceptual study. Analyzing these perceptions and
understanding the reference points was an important part of the coding process.

My background with the program was also crucial in the analysis of the data. According to Merriam (1998), “Categories and subcategories are most commonly constructed through the constant comparative method of data analysis” (p. 179). Therefore, in order to construct categories, I began with reading the first set of data; survey, documents, and interviews. Through each set of data, I recorded notes, comments, or questions about potentially relevant data. It was as though I was having a conversation with the data (Merriam, 1998). After patterns were recognized, I reread all of the data and created categories that are abstractions from the data.

**Technology Pedagogical Content Knowledge (TPCK) Model**

Researchers (Patton, 2002; Yin, 1993) agreed that it is important to identify a conceptual framework in which to guide the collection and analysis of the data. Therefore, in addition to open coding, the TPCK model allowed for the primary lens for data analysis. As you may recall, it was my intention to make sense out of the data by using the TPCK model as the lens in which to analyze the data.

As Glaser and Strauss (1967) cautioned, “Merely selecting data for a category that has been established by another theory tends to hinder the generation of new categories, because the major effort is not generation, but data selection” (p. 37). Therefore, this type of analysis took place after the categories have been created through open coding.
Validity and Reliability

Reliability is “the degree of consistency with which instances are assigned to the same category by different observers or by the same observer on different occasions” (Hammersley, 1992, p. 67). Likewise, validity is “the extent to which an account accurately represents the social phenomena to which it refers” (Hammersley, 1992, p. 57). I addressed this concern by sharing in detail what types of information helped to determine the inference made. Bogdan and Biklen (2007) understood that, “Qualitative researchers tend to view reliability as a fit between what they record as data and what actually occurs in the setting under study, rather than the literal consistency across different observations” (p. 40). Therefore, in this study, careful notes were taken on uniform protocols and used with a peer evaluator to validate the data and the analysis that took place.

Some researchers (Bogdan & Biklen, 2007; Tellis, 1997) suggested that member checks are a way to create validity, however, Silverman and Marvasti (2008) stated that there is no reason to assume that the participants themselves can analyze their own actions and therefore, member checks were not used in this study.

Subjectivity Statement

Based on Herr and Anderson’s (2005) point of view, it was necessary to acknowledge and address my bias in a dissertation study. Therefore, I reflected on my educational career to acknowledge any possible biases in order to address them in planning for this study.

My educational training and experience have been primarily in the field of elementary education. As an undergraduate, I first majored in Health Information Technology, but
quickly followed my dream of becoming an elementary school teacher. I currently have twelve years of experience in four elementary schools, all of which have been within the same county.

I started my teaching career as a sixth grade teacher in Clear Brooke Elementary, which is a site in this study. During that time, I enjoyed the relationships that I was able to develop with each of my students and their families. I especially enjoyed that age group because of the amount of differentiation and projects that were possible through data analysis. Although literacy was always a passion of mine, it was at this time in my career that I acquired my National Board Teacher Certification in Early Literacy. The focus for this certification was for reading, writing, listening, speaking and viewing of children ages 3-12.

After teaching sixth grade for four years, I was approached to obtain my Masters in School Administration. While acquiring this degree, I continued teaching but in a new location, Blue Ridge Elementary. I enjoyed the possibilities that teaching third grade offered. I was able to understand my children and better teach them content through the arts, which led to a new class that I developed, called Literacy Through Art. The next year, I taught 450 second and third graders literacy skills through art. Although this year was very enjoyable, it was my last year of teaching.

I was offered an Assistant Principal position in yet another elementary school, Maugans Avenue Elementary. I found the transition from teacher to administrator a very tough one. I felt like I was unable to create positive relationships with students. It seemed like the only interaction that I had with students was because I was the disciplinarian not to
introduce children to the love of literacy. Within two years I had overcome this obstacle and began to enjoy building relationships with students again. Within the next year, I was asked to become the principal of that same elementary school.

My first year as principal was a very enjoyable one. I created a culture that embedded literacy, collaboration and data driven instructional purpose. After only one year as principal at Maugans Avenue, I was transferred to a much larger elementary school, where I am currently serving as the principal. There was a lot less discussion of data driven instruction the first year because there needed to be more of a focus on safety first. The following school years brought me back to more of a data driven instructional focus, which was important in this school of choice. In 2010, Governor Purdue selected my current elementary school to participate in an assessment program called mCLASS®: Reading 3D.

Throughout this first year of implementation, I attended various state-led professional development sessions as well as led district-wide professional development sessions for teachers on the implementation of mCLASS®: Reading 3D. After implementation, I quickly began to see a change in classroom instruction and discussion and continue to be excited to see the long-term results of this program.

The purpose of this study was not to discover, but to find meaning. It was my intention to construct meaning through observation that was dependent upon the context and with the experience that I bring to this study. With years of interest in data driven instruction, I have a strong belief in what made me successful as a teacher and what has made instruction in four different schools successful. A bias within this study is that I have been
employed in the studied county for 12 years and have worked in the three schools that will participate in this study. Although I do not know all of the participants personally, I do know about some teachers and their work ethic. It was essential that I put this aside while collecting and analyzing this data. During this qualitative research, I remembered the importance of acknowledging biases and setting them aside so that I could correctly analyze the data.

**Ethical Considerations**

Noell & Gansle, (2009) believed “Implementing and sustaining goal-directed systemic change in education is a complex issue at theoretical, pragmatic, and ethical levels” (, p. 78). Therefore, there are precautions set in place at each institution to address such complex issues. Participants will be asked to sign a consent form (see Appendix D) stating his or her willingness to participate in the study. Edmonson & Irby (2008) shared their belief that the purpose of the IRB is to protect human rights in research. I went to great lengths to ensure that the participants’ identity remained anonymous. There were no foreseen risks for participating in this study. The only foreseen benefit for all teachers will be the findings of this study. However, “in planning the research, doctoral students should do their best to anticipate the things their participants might face in the research process and work to minimize any risks that potentially come with being a participant” (Herr & Anderson, 2005, p. 112). Therefore, in this study, ethical considerations were a part of the planning process.

Creswell (2007) shared four main ethical consideration points in a qualitative study: protecting the anonymity of the participants, informing the participants of the purpose of the
research, deciding whether or not to use the information shared “off the record”, and
determining whether I should share personal experiences. In order to account for these
ethical issues, I bracketed the information gained in order to properly construct meaning
shared by the participants.

There are two official ethical guidelines to consider when using human subjects in
research. Bogdan & Biklen (2007) shared these guidelines, stating, “Informants enter
research projects voluntarily, understanding the nature of the study and the dangers and
obligations that are involved. Informants are not exposed to risks that are greater than the
gains they might derive” (Bogdan & Biklen, 2007, p. 48). As a result, I invited the
participants as to ensure voluntary participation. Also, there was a clear explanation of the
study in the invitation to make sure that everyone understood the purpose before agreeing to
participate. In order to ensure protections, I conducted the interviews with participants
within their own school, where the interviewees felt safe. In addition, privacy was honored
and identity was not disclosed; identifiers were given to all participants.

**Limitations of the Study**

There are many limitations to this study. The main limitation to this study is that I
have worked at each of the three sites that are being observed. In fact, I was previously an
administrator at one site, but I made a strong effort to remain aware of my personal
knowledge about the site and program. This could be a possible limitation of this study;
however, precautions were taken to ensure the fidelity of this study.
I have eliminated one school as a site of observation because it is where I am currently employed as principal. Bogdan and Biklen (2007) stated that, “principals should not study teachers in their own school as part of their dissertations unless they can guarantee that the teachers’ cooperation is authentic” (p. 49). In this study, the participants in the other three schools were selected based on teachers who quantitatively demonstrated whether or not they were implementing the program with fidelity. Since I am in no power over the participants, the teachers should give their authentic perceptions as a teacher.

Herr and Anderson (2005) believed another way to ensure authentic participation is to ask participants what kinds of conditions could be set that would allow them to freely consent to participate in this study. For example, in each interview, I asked how they would suggest I handle the worry that there could be reprisals for not participating in this study (Herr & Anderson, 2005).

Keefe & Jenkins (1984) posit that, “The principal who is committed to instructional leadership must participate directly in the key operational aspects of program planning, implementing, and evaluation” (p. 41). By conducting this study, I will show to all participants my perspective on the importance of evaluation of the implementation of this program. By doing this study and emphasizing the purpose of this study, I hope to persuade teachers to give their honest opinion of implementation of this program.

In addition, the purpose of this study is solely to gather information about the teachers’ perceptions of the implementation of mCLASS: Reading 3D. In no way will the
teacher be evaluated with any of the data collected. This study will in no possible way impact subsequent evaluations of teacher performance.

In addition, only teachers’ perceptions will be explored. The perceptions of principals and other staff members conducting assessments will not be examined, so the data gathered may be biased toward teacher perceptions and not representative of the entire implementation of the program.

The research design was crucial, but the data collection methods chosen in this qualitative study had limitations. Administering a survey in a qualitative study has its risks. Edmonson & Irby (2008) cautioned that a survey does not give you an opportunity to dig deeper into the responses. In addition you are unable to clarify to the participant the meaning of each question and the possibility of an invalid survey arises. Furthermore, participants tend to elaborate more when talking than in writing. In an effort to counteract this limitation, I will also interview eight of the participants to gather a deeper understanding of the perceptions of teachers on the implementation of Reading 3D.

Document analysis also has limitations. According to Patton (2002), “They may be incomplete or inaccurate” (p. 306). Therefore, I will use my expertise to review and analyze online reports.

Lastly, generalizability should be considered in a stratified random sampling (Patton, 2006), however, the limited sample size of this study could affect the applicability of the findings. Palmquist (2006) argued that small sample size runs the risk of circumstantial results. However, Yin (2003) communicated that the smaller number of participants will
result in a more in-depth study, which will ultimately impact the field of study. It was also suggested that there could be limitations based on selectivity of participants (Patton, 2002). By using stratified random sampling, I was able to more fully address the selectivity of the participants in this study to decrease the likelihood of this limitation. As a result, this study could provide valuable information to similar counties, but is not necessarily generalizable.

Chapter Summary

In summary, this chapter described the research design selected to guide this perceptual study. This design will guide the type of participant selection, data collection, and data analysis methods. This chapter has provided evidence of the steps that were taken to ensure validity and reliability as well as compensate for the possible limitations of the study.

The purpose of the next chapter will be to report the findings of this in-depth study. As a qualitative researcher, it was my intention to analyze the data in such a way as to understand the perceptions of teachers in one rural county.
Chapter 4

Findings

The purpose of this study was to understand how teachers perceive the program implementation and the role of technology in the reading assessment program called mCLASS: Reading 3D. The following research questions were used as a guide in this qualitative perceptual study:

1. What are the teachers’ perceptions of the implementation of the Reading 3D program?

2. For teachers implementing Reading 3D in grades K-3, what are their perceptions regarding the implementation process of Reading 3D as it relates to the role of technology?

Key Findings

This chapter presents the findings from the perspective of teachers based on the research questions focused around program implementation and the role of technology in the implementation process. The Technological Pedagogical Content Knowledge (TPCK) Framework was used to organize these findings.

Finding 1: Program Implementation

Patton (2002) believed, “unless one knows that a program is operating according to design, there may be little reason to expect it to produce the desired outcomes” (p. 161). Hence, there was a need to reflect on the teachers’ perceptions of the program design.
**Program design.** According to the developers, wirelessgeneration.com (2010), “mCLASS®: Reading 3D is an innovative approach to literacy for K-5 students that balances the assessment of Foundations Skills with Text, Reading and Comprehension (TRC) diagnostics, giving a complete picture of a student’s reading development.” Essentially Reading 3D uses multiple formative assessments electronically in order to isolate skills and ensure mastery. Because these assessments are taken electronically, the analysis from the assessment data are available to the teacher instantaneously by accessing their data on mclasshome.com.

Although all surveys had positive responses overall, it also showed that not all of the 26 teachers were able to accurately describe the program. However, all eight teachers that participated in a one-on-one interview were able to describe the program to some degree. Some were simple explanations such as, “The program has three parts: Assessment, Tracking, Instructional Recommendations” or, “It’s a comprehensive assessment for reading, comprehension and writing used to guide instruction and differentiation.”

However, other responses were more in depth. For example, Teacher 6 shared, “Reading 3D is a way to diagnose reading levels and identify areas of strengths and weaknesses for students. It includes intervention strategies that enable teachers to target weak areas. It also includes a program, DIBELS that is used to identify areas that are identified as areas that are critical for reading success.”

Some teachers were more passionate about the program; for example, one teacher surveyed stated, “It is a wonderful tool for digging deeper into gaps in understanding and
ability. It allows you an overview of limitations to our students and helps you to consistently monitor progress. At the same time, it gives ideas for interventions and reading groupings.”

Teacher 3 stated:

Well, I do like it because it is technology based so I think that it is very time effective for teachers. It is also, I guess you could say that it covers more ground because it is not just looking for reading accuracy and fluency, but it is also looking at the comprehension piece both orally and written. So I think that it gets to the meat of the whole purpose of reading, rather than just reading words on a page. Being able to tell about what you read and understand it. I also think it is still in the process of being developed or rolled out here. There are a lot of kinks to work out, but I think overall, it is effective and I like the fact that it is the same throughout our district where it is making us all look at the same standards and the same materials as we judge or grade our students.

Yet another teacher simply summed up her survey by stating, “It is a comprehensive assessment that helps maintain consistency in testing procedures between students so that results are accurate.”

**Program execution.** After a year of implementation, the eight teachers were asked how the program was carried out; the teachers’ responses varied. Some perspectives were on the overall implementation of the program, while some focused on how the program impacted the individuals. Teacher 5 shared her perspective of the overall program:
Well, I think that overall, everyone sees the benefits of it. Of course we whine and complain about the pitfalls, but I haven’t heard anyone say that this is totally useless. No one has made any of those kinds of comments. They see that with the click of a button, they can see their reading groups and what to do with them. How many times have you sat at home and thought I wish I could discuss this with my team members as to what is best because they are high in this and low in this and now you got somebody else’s opinion right here.

Some teachers shared their perceptions about the rough start, but still perceived the program implementation in a positive light. “Well, I think it was a bumpy road. We didn’t find out about it until the last minute. Considering we didn’t know about it until the last minute. I mean considering the bumps and bruises, it went well. Because I think by the end of the year, the four schools seem to have a good handle on it” (Teacher 3). Teacher 7 added, “I think back to that blitz, which seemed like this huge disaster when no one knew what was going on to last year, we really just supported the new teachers that have not used this program before. I think that it has been very successful here at our school.”

However, not all perspectives were positive of the overall implementation of the program. Teacher 1 shared, “Over all, as a school and as a county, I am not sure that it is very successful because you hear from people who are discouraged by it and don’t like the technology part.” Teacher 8 shared her perspective with the following reasoning:

I feel that the program would be more successful had our county not taken it upon themselves to “raise” the reading standards. The program has been research based
and the expectations were set by analyzing student achievement across the country. This is one reason why the state decided to use this particular reading assessment, because it created common expectations across the country and we could truly see how NC students compared to other states. In addition, increasing expectations made the results useless in a way. We weren’t able to actually use all the components of the program, like the Now What Tools, and we were unable to share the data with the parents. You completely lost the home connection piece and ability to see who was truly behind and who has met grade level expectations.

Some teachers shared more of their perspectives on an individual level. Teacher 2 stated, “We are getting better at it. Speaking for myself now. I am using the reports more. Just getting more comfortable with it and if I get more comfortable with it the kids should see the results of it.” Teacher 1 communicated, “I think in my classroom, yes. I have loved doing the assessments, because they are quick, the data is there for you. I think it is a lot easier as far as the recording goes and completing the assessments.”

Teacher 6 summed it up by saying, “Overall, I like the program and I wouldn’t want to go back to what we did before. I do still use handwritten running records in my reading group, but I think it is effective to have the data that comes out immediately to use but yeah, I think overall it has been successful. I think the technology piece is what has held us back, with their stuff not working, not necessarily you know, the Reading 3D company.”
Finding 2: Technology Impact

Although the Reading 3D program has similar early literacy assessments, it introduces technology within these assessments. “When technology is added to the educational environment, teachers must consider (1) how technology can be applied to enhance learning, (2) how use of technology change what is learned, and (3) how technology can be used to enrich the evidence of student learning” (AACTE, 2008, p. 245).

Technology design. Technology is generically defined as “tools created by human knowledge on how to combine resources to produce desired products, to solve problems, fulfill needs, or satisfy wants” (AACTE, 2008, p. 5). In this study, technology is the medium by which the assessment data is collected and dispersed. Teachers use a mini touch screen laptop computer called the DakTech PlaidLet to collect assessment data and mclasshome.com to review the data that is collected. Since both of these mediums were new to the early literacy assessments, professional development was offered at the beginning of implementation.

Technology influence. There is no dispute that technology impacts instruction, but the impact can be either positive or negative. During this study, three key themes surfaced from teachers regarding how technology influenced the implementation of Reading 3D. According to the open-ended surveys, technology influenced the perceptions of the effectiveness of this program in numerous ways. The three overall themes that surfaced included the usefulness of technology, lack of technology skills, and unreliable technology.
Technology is useful. Sixteen teachers mentioned that technology helped to autoscore the assessments and then made it easier to analyze data. Seven more teachers were excited because the technology made the assessments quicker, while five more appreciated less paperwork with these assessments. One teacher shared in her survey, “I feel it is very useful and assessing students is less time consuming and more consistent because of the technology.” Teacher 8 shared:

The PlaidLets have allowed me to bring home less paperwork and create a backup of all student records. It has created accountability for the teachers by making sure that all assessments are being done in a timely fashion and that follow up activities and assessments are done. From my understanding, the DIBELS portion of the assessments has greatly improved with the use of the technology by automatically scoring the different assessments, which reduces the teacher error in scoring. The technology has also taken out or decreased the scoring errors that the administrator could make of the DIBELS and reading records (TRC).

Another perspective on how technology has made an impact came from Teacher 5 who stated:

I mean the technology has allowed it to be, uh, to be completed in a more timely fashion so if you are doing a large class, you are able to get through the assessments in a quicker manner so it takes away less time from instruction I think. Um and it lets you know quickly the results or instantaneously done through the computer. I mean you don’t have to sit there and do any of the calculations. You can go back in at the
end of the day. You know, say if you did an entire reading group that day. You can go back in and see if you are teaching what you think you are teaching to that group by the results and see if they are caring through with what you think you accomplished with the students. Um within of course, the last several weeks of instruction. So I think it has been beneficial for the teacher and if the child has to switch schools within the same district. That would be a benefit for the student as well as the teacher.

One teacher summarized on her survey, “The technology allows the assessments and progress monitoring to go smooth and quickly. Technology has made the assessment more organized. It also allows you to have easy access to each child’s data.”

*Teachers lack technology skills.* Some teachers felt that the technology portion stretched the ability of some teachers. One teacher shared in her survey, “People uncomfortable with technology faced a larger learning curve than those who are comfortable. Also as with any change, you have resistance and this “tech fear” feeds into that resistance.” Another teacher shared, “Once you learn how to use it appropriate and correctly without all of the flaws. It is a good asset.” An additional kindergarten teacher shared:

I think it puts some teachers out of their comfort zones with the technology as far as using the PlaidLets where other teachers really took to it…I myself enjoyed keeping everything in one spot and I find when we did the DRAs before with the paper and pencil, I had papers everywhere, where now it is all on the PlaidLet. It is all right there and it is more…umm…it is easier to get a hold of that information quickly instead of digging through stacks of paper work. We definitely have some staff
members that you know, uh, look for a little more guidance as far as how to use the
technology, using the stylus, using the keypad, writing, but I think that using the
PlaidLets, since you are just writing on them, or tapping them, it makes it a lot easier
for those teachers that were a little hesitant to use them in the beginning (Teacher 7).

**Unreliable technology.** In the open-ended survey, over half mentioned their
problems with the PlaidLet not always working. In that same survey, ten teachers stated they
had problems accessing the data and seven shared they had trouble syncing their information.
All of the teachers interviewed mentioned that the technology is unreliable. One survey
response communicated, “Technology is at times touch and go. Sometimes it works.
Sometimes it does not.” Teacher 3 echoed, “I just think that it is a little tricky from a …the
stylus wasn’t always aligned. I am not sure if it is our internet in this building or if it’s the
PlaidLet, but it is really easy to loose internet connection and if you haven’t sunk yet then
sometimes that makes it hard because that will delete your data.” A third grade teacher
shared:

> When it is working (which is about 75% of the time) it is great. Um…it works well,
but you always have that percentage of time when it doesn’t work. In fact mine
recently, has gotten to the point with my pen, it may or may not highlight whatever it
is I am trying to get done so while I am pecking away the student has gone on without
me. So I have to have them pause a minute so that I can catch up (Teacher 2).

Teacher 1 liked the end result, but views the technology, as somewhat of an inconvenience
stating, “The technology sometimes is a burden because it doesn’t always work
appropriately, but it is nice to have the data immediately and it is nice to see the graphs of the students progressing as you assess them. And I think it is a lot quicker than the pencil and paper assessment that we used to do, when the technology is working.”

**Technological Pedagogical Content Knowledge**

The TPCK framework is a complex interaction among three bodies of knowledge: Technology, Pedagogy, and Content. In order to further report teachers’ perceptions on the impact that technology in Reading 3D has had on classroom implementation, I will focus on the following categories of this framework: pedagogical content knowledge (PCK), technological content knowledge (TCK), technological pedagogical knowledge (TPK), and technological pedagogical content knowledge (TPCK).

**Pedagogical Content Knowledge**

PCK refers to the conditions of teaching that encourages learning and connects assessment to learning (AACTE, 2008). The purpose of any early literacy assessment should be to access and address learner difficulties. Therefore, it is no surprise that the purpose of Reading 3D is to assist teachers in locating and working with students in order to increase their achievement levels.

**Early literacy assessments.** All but one of the 26 teachers who completed the surveys believed that the assessments were somewhat similar to those they previously administered. One teacher stated in the survey, “They are similar because it’s some of the same assessments, but they are done electronically and mCLASS sorts the data for you once you’ve completed the assessments.” Another survey read, “TRC (Text and Reading
Comprehension) is similar to DRA (Diagnostic Reading Assessment) in the way you take the RR (Running Record) and MSV (Meaning, Syntax, and Visual). But different in that TRC is faster and I feel more effective.”

Some teachers shared that Reading 3D includes the same basic assessments, but also has additions in the timed assessments and written comprehension. When asked about the similarities or differences, seven surveys included statements similar to, “Reading 3D is more accurate” or “has less inconsistencies.” Only five of the teachers surveyed reported they had used DIBELS before. One teacher reported, “DIBELS is very different”, while another stated, “they assess the same information, but each time you assess, the words change with DIBELS. To me, this makes the assessment more valid than the state’s assessments.” In her interview, Teacher 8, who is highly trained on the program noted that she “was familiar with running records, but the DIBELS portion of the assessment were completely new to me. I had to first wrap my brain around what they were assessing and why before I could properly give the assessment.”

The survey data revealed that the writing component was a major change between the two assessments. Some responses were quick such as, “Reading 3D requires written comprehension and Running Records did not.” While others were more in depth, such as: The TRC’s are very similar to the DRA’s and daily running records that were done in Guided Reading groups. The only difference is the comprehension expectations. TRC’s expect the students to not just retell a story, but to be able to answer various types of questions and at varying difficulties (more true to Bloom’s Taxonomy) and be
able to write about what they have read. This piece was missing and has shown to be a weakness across grade levels and across schools. Reading and Writing are reciprocal processes, yet this is the area in which are students are struggling the most. (Teacher 8)

When asking for the perceptions of teachers on the similarities and differences between the Reading 3D and previous assessments, one teacher summed it up on the survey by stating, “The running record portion is similar, but the set dates and writing piece for comprehension are very different. The progress monitoring is also a different piece.”

**Progress monitoring.** Progress monitoring is an assessment given in regular intervals in order to predict growth of each student and assess the appropriateness and effectiveness of an instructional program. As previously stated, progress monitoring is an addition to the early literacy assessments previously conducted in this county.

All of the teachers surveyed stated that progress monitoring impacted their classroom instruction. Progress monitoring guided their small group instruction based on their students’ needs. One survey stated that they liked the fact that this program “catches students failing before the benchmarks through progress monitoring.” Another teacher stated, “When you progress monitor, you see if a child is making growth. It also guides your lesson planning process and gives you specific skill individual students or groups of students need targeted instruction on.” Yet another communicated, “When I progress monitor, I am able to see if the child is improving, staying the same, or moving down. I can take the data and plan different ways to teach the child in the area he or she is weak in.”
It is important to understand how teachers perceived the purpose of progress monitoring. One survey read, “The problems that are noticed during progress monitoring and benchmarking serve as a guide to future lesson needs.” A first grade teacher wrote, “The progress monitoring reports help me flag students that may not meet the next benchmark’s goals and work more with them so that they will be successful.”

**Technological Content Knowledge**

Technological content knowledge refers to intelligence about how technology may be incorporated in order to offer new ways of delivering the content (Niess, 2005). Understanding the perception of how technology has impacted these assessments and their uniformity will show if the teachers might utilize the program in its entirety.

**Uniformity.** Implementation studies are valued as useful information and, according to Klein and Sorra (1996), are considered effective depending on the uniformity and quality of the use of a specific program such as Reading 3D within the entire county. When questioned about the perception of whether or not this program has helped with assessment uniformity throughout the county, there were two perceptions.

**Technology has increased uniformity.** The first perception is that the technology has increased the uniformity of assessments through the studied district. Teacher 6 shared her belief, “Technology has played a huge part in creating uniformity in these assessments. The standards are clear and unbendable. The assessments have to be given in their entirety—meaning you have to find the frustration reading level.” She went on to share, “I like the way that teacher’s can’t fake the data and look like they are meeting students’ needs when the
direct opposite is true.” A kindergarten teacher, shared a similar perspective stating her thoughts on the new way to assess:

I think it is because you can’t cheat the system. Umm... It is more black and white.... where there is a not a lot of room for interpretation with previous assessments, it seemed that you can, I don’t want to say ‘fudge’ the data, but you can kind of make it... If you need a child on a 16 to go to the next grade level, you can kind of ...use your DRA to well, if you are doing it while they are reading, then I mean. I mean, well that is what I try to do. After I do the probe, I just hit OK. I don’t try to go back and ask was that right? I mean it has a timer on the top. The automaticity is clearer. I think that it has helped. I don’t think that our teachers are tech savvy enough to fudge the data if it isn’t quite what they were hoping it would be, so I think that by making it very cut and dry.... It is good information so it helps your instruction, so you wouldn’t want to go back and change something if this is going to give you the tools to help where the child is struggling (Teacher 7).

Even teachers who were not progress monitoring as often as required appreciated the consistency of the program and one shared, “You can focus on more consistency throughout the county with what is offered. For example, when it comes to the recall, you know what you are looking for. Everybody should be looking for the same things in the writing pieces and everybody has to do it orally and looking for specific things as far as feedback from the kids” (Teacher 4).
One teacher who used to be a teacher assistant for several early grades teachers really understood the inconsistencies of these assessments and so her response was very detailed. She shared that the new program has increased, “the consistency of how often you are testing and when you are testing. I know that with the K-2 assessments there was no consistency” (Teacher 3). She went on to talk about she witnessed it done several different ways. “Some did it whole class, some did it small group, some would give their students, they would call out the …I am thinking about the writing when they would have to call out the 25, 50 or 250 high frequency words.” She summarized her perspective by stating, “so it depended on the teacher how that was done and those scores are not going to be compatible.”

**Room for teacher error.** Although uniformity should be a benefit from the technology, half of the teachers interviewed shared that this program still had room for teacher error. Teacher 2 shared that, “in order to reduce teacher bias, you must follow the directions given exactly in order to get valid scores that you can compare.”

Teacher 1 shared that she felt like the technology may actually hinder valid results due to lack of teacher comfort with the PlaidLets. She explained her perspective by stating, I feel like if people are not comfortable with the technology then their students may not be scoring as high or they may be scoring them too high just because they are not comfortable with using it. I know that with those 60 second DIBELs assessments, you know, if you are not comfortable with getting everything checked off and completed like you are supposed to, then you are going to slow up the child and it will take away time for their score. You are using their seconds.
Two of the interviewees shared that no matter what; some teachers would find a way to skew the data with or without technology. Teacher 5 laughed while admitting, “As a classroom teacher, you don’t even realize that your mouth is doing something to help coax a child. I mean, you know, seriously.”

Professional development. Another theme among the teachers was the professional development that was needed in order to make the necessary changes to their classroom. Twenty-one of the teachers surveyed indicated that they received over four hours of training focused particularly on using the PlaidLet. Seventeen of the teachers surveyed indicated that they received less than three hours of training on how to use the data analysis component from mclasshome.com.

Characteristics of training. The findings revealed that the participants in this study received a wide variety of professional development training. For example, two of the eight participants interviewed received multiple training sessions through the Department of Public Instruction (DPI); two of the eight teachers attended a week long Teacher Academy training, while four only received a total of one and a half days of training within their schools.

Teacher 8 received training at DPI and shared details about this training:

I went to a two full day training sessions provided by the state of North Carolina to initially learn about the program and receive training on each assessments from Wireless Generation trainers. We were broken into smaller groups of about 20 and were given palm pilots to practice administrating each of the assessments. We were asked to pair up and practiced giving and taking each of the assessments. A few
months later, I was asked to go to a one day training session to discuss how to further utilize the program by interrupt and analyze the data. This was done in a larger group. Most of the day was spent asking questions to the NCDPI representatives. The rest of the time we didn’t have access to the entire school’s data and was unable to fully see what the principals see when looking at data as a whole.

Teacher 1 stated:

The trouble with us at the state level was there that they had the little palm pilots and we were using netbooks here, which we had them with us, but the people there weren’t sure how to use what we had so we were using the palm pilots because that was what they had and it was easier to use that with them and then we had to come back on our own and try to figure out to use the netbooks.

Not all of the perspectives of the professional development were completely positive. Teacher 4 stated, “When we got the PlaidLets, there was no initial training on how to use the device before the first training session for the staff. I figured out how to use it through trial and error and with the help of the county’s tech representative and you, the principal at a nearby school that was implementing the new assessment tool.”

“In addition, the training was slow because the technology wasn’t working right, but, “once we got in, I would say, it was beneficial.” Teacher 6 went on to explain, “We were given an opportunity to practice and we also saw somebody model how it should be done before we did it. So I felt like coming out of there, we had a good enough grasp that we could go back to the classroom and begin.”
Teacher 2 shared, “It has been a whole lot of training to it and we were thrown into it without enough practice. But it didn’t really matter because, I mean that day I got so frustrated because there was just so much and so little time and I thought oh my gosh.”

**Most effective traits of training.** When asked about what was the most effective part of the professional development, most of teachers agreed that the practice was the most effective. Teacher 8 said, “I think actually using the technology was most effective. It’s one thing to see it on a screen and look at the testing materials, but getting your hands dirty and practice doing the assessments is where the real learning takes place. Practicing administrating the tests build your confidence in the program and make the results more valid because the administrator is making fewer errors.” Another teacher who attended the same training stated, “If you have the ‘professional’ next to you, you feel a lot more comfortable with it. So, I think the most effective of it was the practice and just getting into it” (Teacher 7).

Teacher 6 shared her perspective by stating, “I think the demo was one of the more effective pieces of the professional development on the PlaidLet and technology piece. Watching someone else do it.” She continued by saying, “it wasn’t just using the technology but it was also a refresher for everybody on this running record piece and are we using the marks correctly and are we consistent in how we listen and you know interpret what we hear.” Teacher 5 shared a similar perspective, “Well, we had the PlaidLet and without that I would not have been very successful. I mean, right off the bat, by myself trying to navigate through it to try to figure out…pulling up the assessments.”
**Improving training.** All of the teachers surveyed were asked about how their county could help better prepare new teachers for this new literacy assessment. There were many ways that were suggested; multiple training sessions with opportunity for practice, mentoring and modeling for new teachers, a good literacy background for assessments, adding training to New Teacher Orientation, and separating the groups according to need.

Five teachers believed that multiple training sessions would be beneficial with the opportunity to practice in between the sessions. “I think practice is the biggest thing, and not just using the demos, but using actual students, their students, and having that guiding person, someone who knows what they are doing” (Teacher 7). She went on to say, “I think just giving them a little time before they actually have to jump right in and test children to be able to explore these test and look over the material.” Teacher 6 simply said, “Trying to cram two days worth of training into one day is madness. The teachers get overwhelmed and valuable information and practice time is lost.”

Four of the teachers suggested having a mentor or partner for the new teacher would be beneficial. Teacher 7 shared:

I think maybe pairing a new teacher that has not used it with someone who has. And maybe letting them watch another teacher do it and I think even the demo that we did where we all did it together and then we went back and checked. Maybe as a teacher is testing a child, the new teacher can sit with their own PlaidLet or iPad and do the same thing. And then go back over and see how closely their marks were with the
teacher who was testing. You know just kind of compare and make sure that they are on the right track.

Three teachers also shared how understanding the basics behind literacy assessments would also be beneficial to the implementation of the program. “First, make sure the teachers have some background knowledge in the literacy ideas. They need to know why they are doing and what they are looking for. They need to be familiar with phonemic awareness terms and be able to easily identify them” (Teacher 8).

Three teachers suggested adding this training to New Teacher Orientation (NTO) so that the new teachers would receive the training early in the year, while increasing countywide uniformity. “Maybe that should be one of their training or something during NTO. That way they would all be on the same page” (Teacher 5). Teacher 4 shared, “It needs to be a part of NTO or at least during that early time frame.”

Other teachers suggested having separate training groups based on the teachers’ knowledge of the technology. Teacher 3 reasoned her suggestion by stating:

It is a learning curve. If you are someone who is used to technology and learning how to work with these products, it is easier to learn. But if you are someone who doesn’t have any technology experience, you are trying to learn both the technology and the program. So it varies the learning curve. Like if, I were going to do a roll out to a new school, knowing what I know now, I would not have one training program. I would almost do a pre assessment of where do you think you are and then have two separate groups. One with people who are comfortable with the technology and just
need to learn the program versus people who really need to work on the technology in conjunction with learning the program.

Teacher 4 simply stated, “maybe half days for two or three days instead of all at once.” She went on to suggest separating the groups because, “Kindergarten and first grade do it differently than we do at third grade. So if you are sitting there and trained on everything.” She felt as though she wasted time learning about assessments that she was not required to administer. “I mean some of that I have never used so I think that if I could have just focused on what I had to do, DIBELS, TRC, and WUF maybe…just give me what I have to know so that I won’t be overloaded.”

**Technological Pedagogical Knowledge**

Technological Pedagogical Knowledge is the awareness of the existence and potential in the range of technologies available and understanding the impact that they can have on teaching and learning (AACTE, 2008). Due to the use of technology, this program offers the benefit of the immediate disbursement of data and the impact that it should have on instruction.

**Data analysis.** The survey indicated that most teachers perceived this program as offering immediate access to data. However, five teachers admitted to rarely using this data to improve reading instruction, while eight stated they only use it monthly. Conversely, there were five who shared that they utilize this information on a daily basis. One teacher surveyed believed that, “the technology has impacted the use of mCLASS: Reading 3D. It has made it a lot more convenient. You are able to get the data immediately.”
During the interviews, six teachers shared how their perception of teaching has changed because of the data analysis portion of this program. Four shared how the data has led them to plan their guided reading groups differently. Teacher 7 admitted, “I just figured if they didn’t get it, it was probably a comprehension issue. When you actually go back and you can see which students are where and you can group them on those skills, it keeps your GR more flexible, but it also targets those skills that those kids need.” Teacher 8 described a specific example of her group changes:

I used the small group advisor to put my students into reading groups and then use the activities that were tailored to their specific needs. I loved how I could use FCRR.org with the results and continue to find multiple ways to meet the learning objectives and provide lessons that reached multiple learning styles. For example, my tactile learners truly benefited from the phonological awareness lessons where they were able to walk out the syllables or knock the onset and pop their hands open for the rhymes. I really thought about my tactile learners, especially with the male students, who need something beyond visual and auditory instruction. The impact on student learning that this battery of assessments provide is truly invaluable. She went on to explain, “Seeing the results instantly and being able to log on to the website and see my class as a whole helped me the most. I was able to see my students weakness and strengths without having to spend hours of breaking each assessments results down.”

Although data analysis is an important component of this program, 17 out of the 26 teachers surveyed stated that they have received less than three hours of training on how to
use the data analysis provided from mclasshome.com. In addition, 12 out of the 26 teachers stated that they engage in less than one hour of discussion around this data each week. In the open-ended portion of the survey, 18 teachers asked for more professional development on the program, while nine teachers specifically asked for the professional development to be on the data analysis portion of the program.

During her interview, Teacher 3 stated she had, “one training session last year about the data, but again, when you have everyone in there, it is hard to talk about it in such general terms. You can’t get in and manipulate to your students.” Her suggestion was to have a professional development about what just applies to you or your grade level. She explained her need to know, “how we can group our kids and what that means. What does it mean if I put my kid in box 7 instead of 8? What is the difference or what is the tools that go with it.” She went on to say, “in that overview meeting there was a lot thrown at us, but it was easy to forget. I know there was something that would tell me where there was some activities…where was that?”

When asked about how much data discussion was available, Teacher 2 stated, “Not a lot to be realistic. I have been told what is expected, but the problem is that not everybody knows how to do it themselves.”

Home school connection. Another reason this program was selected for the state of North Carolina was because of the home school connection piece. For an additional charge, schools have access to data supported detailed reports for parents. See Appendix F. Although there were no specific questions about the home school connection on the survey,
seven teachers mentioned this as a benefit of this program. All of the teachers interviewed knew about these parent reports. Teacher 8 stated:

My favorite report is the Home Connection letters. Parents often ask what they can do to help their student succeed in the classroom. Often times you have to come up with ideas off the top of your head that are not as beneficial as they should be and parents can often forget what you suggested. These reports break down their student’s scores and give them a parent friendly explanation and then lists activities that a parent could do with their child. No matter what level the students are at, there are always suggestions for the parents to keep improving the instruction that student is receiving at home.

Teacher 2 stated that she is starting to print them to give to parents during conferences. “The good thing about the report is that it gives things that they can help with at home while we are working with them here. It can’t all be done here and so you have got to have help. So, just like to let them know what is going on.”

This year, it is the perception of teachers that they were asked not to send home these reports at the beginning of the year because of the discrepancy in the reading levels set by the state and the county. Although there were no specific questions about the home connection report, two of the teachers surveyed and six of the teachers interviewed discussed their perceptions of this new development.

One teacher said in the survey that she would like “support from the county to use the research based expectations that has been set by the program, especially when the end of the
year expectations are the same.” Teacher 1 also shared, “I have used the parent reports and actually have sent them home, but then I heard don’t send them home, so…they discussed using them for PEPs, if they are below in (county), so that would be a good time to use those reports. But, I thought they were good reports to use at all times.”

**Instructional impact.** Risko (2010) stated that, “assessments can transform instruction by providing timely information that captures students’ strengths, needs, and specific instructional history” (p. 420). Teacher 4 shared her perspective stating, “it helps us as teachers sometimes no matter how long you have been working, you get a little stagnant and that is true.” She went on to say that she liked the assessments because now, you can go back and look and see that, “Wow man I need to address this because my kids aren’t getting this. I have a big chunk of kids who aren’t getting this so I need to brush up and back up and start over again and you know, see what I can do to help raise this.” A different teacher at the same site shared on the survey, “The assessments are quicker! Which allows more time to teach.”

Teacher 8 was amazed at the power of the program and said, “I truly like the Reading 3D program. The first time I did the assessments, I saw the weakness in my classroom instruction and was able to fix it quickly.” She went on to say, “I like the fact that the program gives you all the resources you need to plan an effective lesson and gives you access and resources to help you find more activities and lesson ideas. It just doesn’t stop with the results, but truly makes an effort to meet students’ needs and help make them successful.
With the use of this program, a solid foundation in literacy can be made for most, if not all, of our student population.”

Almost half of the teachers surveyed mentioned the impact that these assessments has had on their guided reading groups with statements such as, “The Reading 3D levels allow me to place students in Guided Reading Groups according to their instructional levels based on accuracy and comprehension.”

All but one of the teachers interviewed mentioned how these assessments have impacted their small group lessons and/or Guided Reading Groups. Teacher 2 explained, “I use it for driving instruction, small group lessons that someone is struggling with, so it is fast. It is there to use however, you see fit. I try to keep up with it pretty often just to see what my kids are doing.” While Teacher 1 stated, “I am more aware of which students need extra help and extra teaching to reach their benchmarks, because all of the progress monitoring that we have to do. I know that if they are in red or yellow I need to teach them these skills so that they can get to where they need to be. I have also used the activities on the PlaidLet when I am doing Guided Reading as part of the word work.”

Some teachers were very detailed with their examples such as in this quote:

When I pull my Guided Reading groups, using the Now What Tools, if I have two students who are really struggling with syllables, I go right to their name and it goes right to those lesson plans specifically for syllable instruction and it tells me which students need these. So it makes it…It is more effective instruction and it is targeted instructions, so it is not you sort of need this, but you don’t really have a clear path,
where this kind of says…Here is what is developmentally appropriate and here is what is going to get them to that next level. So the Now What Tools, both on the PlaidLet or within where you print them out from mCLASS have been very beneficial (Teacher 7).

Teacher 2 shared another specific example:

I know that I have got one student and she is pretty bright, good grades and I thought and listening to her mother of how good she was so when we did our benchmarking at the BOY, it showed up some glaring weaknesses that she had. So I think it helped me see that she is not where I thought she was or she thinks she is or her parents think she is. And so I had to put her in a lower reading group because she wasn’t where she needed to be and I could have easily overlooked that because of what she does in class but when we sat down one on one it showed she didn’t have it, but it has gotten better. It has been a progression. She has gotten progressively better. She may end up being where she needs to be, but this alerted me to be on the look out for what I might ordinarily have noticed.

Another interesting perspective of how this program has impacted instruction is that it doesn’t always have to just be about the lowest students.

We usually look at the middle group or low group, but I am also kind of concerned with my higher readers so I like to find interventions for them that can keep pushing them along. Some time I feel like I leave them out and you know? I want to make
sure that I am pushing them and giving them the interventions they need to push ahead as much as I do my lower level children that are struggling (Teacher 6).

In addition, this first grade teacher also shared that, “it helps to see the percentages that you have in the class. It does help me to differentiate my centers too and in reading groups.”

Although most of the reviews were positive, Teacher 5 felt like sometimes this program has a negative impact on instruction. She stated:

Well sometime it negatively impacts instruction because of the time factor, but the overall assessment, when we have to do the BOY, MOY, EOY that goes faster. You know what I mean? Faster then it did when we did pen and paper instruction. So that saves instruction time. But when I have to do PM, that loses instruction time and I don’t know what the happy medium is. Sometimes I wish that we just had somebody where we could just send them to, to be progress monitored. Maybe the progress-monitoring fairy.

**Program Implementation Overview**

Throughout this perceptual study, three themes emerged from the data: benefits of the program, challenges of the program, and what is still needed.

**Benefits of the Program**

According to the survey, there were overwhelming benefits of the program (see Table 7). The biggest benefit that eighteen of the participants suggested was the immediate feedback. Although the assessments were perceived as generally close to the previously administered assessments, ten teachers felt like the assessments took less time to administer.
The technology portion of this program was given credit for making these assessments less time consuming along with immediate feedback. “Now with mclasshome, there is a quick turn around with the data.” Another teacher shared, “I still say the benefits is immediate feedback from the assessments. The computer gives you suggestions on how to meet the needs of your students that show weak areas.”

Table 7

Implementation Overview

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<tr>
<th>Benefits</th>
<th>Challenges</th>
<th>Still Needed</th>
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<td>Immediate Feedback</td>
<td>PlaidLet Issues</td>
<td>Training</td>
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<td>Quicker Assessments</td>
<td>Time Management</td>
<td>Training on Data Analysis</td>
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<tr>
<td>Helps plan better lessons</td>
<td>Can’t Access Data</td>
<td>Better Technology</td>
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<td>Progress Monitoring</td>
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<td>Less Paperwork</td>
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<td>Better Communication</td>
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As previously stated, the data that these assessments make available are often impacting how and what teachers are planning. In the open-ended survey, ten teachers recognized this as one of the biggest benefits of this program. One teacher shared, “Reading 3D has been very beneficial to me. I am able to see my students’ strengths and weaknesses. I am also able to plan guided reading and remediation instruction based on this data.” One
teacher went on to say, “better accessibility to true data to be able to group and drive my instruction.”

In addition to the immediate feedback, technology is also given credit for the decrease in paperwork that was previously involved with assessing students. “I think the technology helps because everything for the assessments is right in front of you, so it is a lot less paperwork,” and “this program helps teachers with the paperwork of running records.”

According to seven teachers, the opportunity for easy access for teachers to communicate with parents is also a benefit from this program. “I like the great home to school connection.” Yet another survey indicated, “I like the parent letter that showed where the child was of what the family could do.” One teacher finalized her comments simply by stating, this program had, “a true impact on student learning.”

**Challenges of the Program**

Although the overall perceptions of this program were positive, there were a few challenges that emerged throughout this study, most of which related to technology use (see Table 7). “Are there problems with it? Sure. The time management piece, the technology piece when it is not working, and some of the people that don’t get on board with the program, but for me personally, I think it has been successful.”

Half of the teachers interviewed talked about the problems with the PlaidLet. One teacher just said, “Malfunctioning PlaidLet” another complained about the “battery life of the PlaidLet.” Another was frustrated and said, “half of the time the PlaidLet does not even work.”
Almost half of the teachers talked about the challenge of managing their time. Although ten teachers surveyed reported that the assessments were quicker, twelve reported that it was hard to manage all of the progress monitoring with all of the other instructional requirements. One teacher stated, “It is hard to find time to complete testing and guided reading.” Another teacher reported, “The biggest challenges are finding time to do all the progress monitoring with everyday schedules. I feel I have gotten better at it, but I still feel like it impacts their guided reading schedules.” One teacher described it as a, “work of art to schedule all the extra intervention groups and one-on-one students.”

Many teachers expressed frustration with Wireless Generation. One teacher shared, “At the beginning of this year, TRC would not appear on class summary and it took the company until November to correct this problem.” Ten other teachers stated that they were not always able to access their data through the mclasshome.com website. One teacher said, “The most frustrating challenge is when the PlaidLets do not sync, or this year’s data does not appear that you have done.” Another survey stated, “There are glitches in the system for accessing data.” Seven other teachers complained because they had trouble syncing their device in order to see the data on mclasshome.com. “High traffic sync times, random program issues, log in issues, incorrect syncing issues are some of my challenges.” Yet another teacher shared that, “there are sync issues especially at benchmark times.”

Over half of the teachers were not satisfied with their perception of how the program was being implemented. Eight were frustrated because they did not have enough progress monitoring books that matched the book titles offered through Reading 3D. “We don’t have
enough good progress monitoring TRC books.” Another seven were not in agreement with the county decision to make the proficient levels higher than the research-based decision of wireless generation. “It’s frustrating that the standards don’t match” our county. Another teacher shared, “The challenges I face are with the (county) taking on Reading 3D, but not accepting the leveled texts as grade level.”

Needs

Although some participants couldn’t think of anything they still needed to make this program implementation more successful, most participants admitted that there were still needs to make this a successful program implementation (see Table 7). Eighteen people admitted they still needed more training on this program. An illustrative comment was, “We need more training and practice to help us be better prepared.”

In addition to those eighteen quotes, nine teachers specifically stated that they needed more training on the data analysis portion of the program. “I need more training and instruction as well as time to learn features and how to analyze the data.” One teacher described her needs as support, “I need more support using the mclasshome website and getting all I can from the data that is generated.” A different teacher was talking for the team and said, “We need more training on using the data once given to better target the needs of individual students.

Although all teachers mentioned technology issues that they were having with the PlaidLet or internet connectivity, nine teachers specifically mentioned that they needed better technology if this program was going to be successful for them. “Better internet
provider/more technology and better equipment to help with the glitches. Another teacher simply stated, “We just need updated technology!”

Chapter Summary

The key findings for this perceptual study were developed from an in-depth study from one rural county. The data was collected through a compilation of twenty-six surveys and eight interviews. This data collection was guided by the following research questions:

1. What are the teachers’ perceptions of the implementation of the Reading 3D program?
2. For teachers implementing Reading 3D in grades K-3, what are their perceptions regarding the implementation process of Reading 3D as it relates to the role of technology?

The findings of the teachers’ perceptions were reported in this chapter first by understanding these two questions and then categorizing them in the three components of the Technological Pedagogical Content Knowledge Framework. In addition, I offered an overview from the perceptions of participating teachers. Secondarily, these findings will be analyzed using the theory of perception.

By completing this research, I began to understand teachers’ perspectives of the implementation of Reading 3D in one rural county and the impact that new technology has had on this program. Throughout the next chapter, I will begin to try to discover the implications of these perceptions.
Chapter 5

Discussion

In the previous chapter, the major findings from the perspective of teachers from one rural county were reviewed. This chapter will also summarize these findings primarily through the lens of the Technological Pedagogical Content Knowledge Framework (TPCK) with a secondary look at perceptual research. Furthermore, I will consider the implications of these findings in relation to future research. I will conclude this chapter by acknowledging the limitations of this study along with points of interest that I acquired throughout this study.

Review of Purpose

Educators continue to search for new ways to improve literacy instruction while making the learning environment more appropriate for students. The research continues to grow on literacy development in young children (Clay, 2001; IRA & NAEYC, 1998; National Research Council, 1998; Neuman & Dickinson, 2001; Shanahan, 2003; Yaden, Rowe, & MacGillivary, 1999). Researchers agreed that literacy expectations have now advanced from the basic paper and pencil assignments to include technology (Clay, 2001; Coiro, Knobel, Lankshear, & Leu, 2008; Leu et al., 2004). As part of Governor Beverly Perdue’s Ready, Set, Go! initiative, NCDPI, North Carolina Teacher Academy, and Wireless Generation partnered in a statewide initiative to implement mCLASS®: Reading 3D as the diagnostic assessment for reading in elementary grades.
The purpose of this perceptual study was to understand how teachers perceive the program implementation and the role of technology in this reading assessment program. The following research questions were used as a guide in this qualitative study:

1. What are the teachers’ perceptions of the implementation of the Reading 3D program?

2. For teachers implementing Reading 3D in grades K-3, what are their perceptions regarding the implementation process of Reading 3D as it relates to the role of technology?

Knowing the extent to which technology in Reading 3D is implemented will allow us to better understand which program characteristics are contributing to the desired outcomes.

**Summary of Key Findings**

Based on the work of Pressman and Wildavsky (1984), “It is not enough simply to ‘implement’; one must choose the right implementation plan. But then, by the same logic, one must know the right way to implement the implementation plan” (p. 166). This study set out to examine the implementation of Reading 3D as perceived by the teachers who are in the second year of implementing this program.

The purpose of the TPCK is to recognize the information that is needed for teachers to be able to properly integrate technology into their teaching. The AACTE (2008) reported that, “While the acquisition of content knowledge and pedagogical knowledge are critically important to the preparation of K-6 literacy teachers, the knowledge of how, when and why to use technology effectively in teaching literacy seems just as relevant for today’s teachers”
(p. 61). Therefore, this framework will be used as the primary structure for discussing the major findings of this study, with a secondary look at perceptual theory.

**Finding 1: Program Implementation**

The first research question was: What are the teachers’ perceptions of the implementation of the Reading 3D program? “Unless one knows that a program is operating according to design, there may be little reason to expect it to produce the desired outcomes” (Patton, 2002, p. 161). The Reading 3D program aims to: (a) Ensure that students are adequately prepared for the next level of coursework as set out by the Standard Course of Study, (b) Save time by using technology to accurately record information, (c) Facilitate more frequent formative assessment for struggling students, (d) Enable teachers to determine student-learning needs and individualize instruction, and (e) Make it possible to provide interventions for students in a timely manner (wirelessgeneration.com, 2010). Therefore, there was a need to reflect on teachers’ knowledge and perceptions of the program design.

**Grade level.** It was surprising that none of the teachers specifically discussed their role in ensuring that students are adequately prepared for the next grade level. However, it is essential to mention that two teachers did share that if this program were to be implemented correctly, it would provide a more solid foundation for literacy throughout the district. Ultimately, they were looking at the bigger picture, not just at the progress that the students make in their classroom in one school year. Although there were no specific questions on preparing students for the future, only these two teachers in the interviews or surveys acknowledged this as a purpose of the program.
**Time saver.** The program’s intentions are also to save the teachers time by using the technology as a recording device, but perceptions of teachers vary even in the same school and district. A study conducted by Purkey and Schmidt (1987) demonstrated that, “All experiences are phenomenal in character: The fact that two individuals share the same physical environment does not mean that they will have the same experiences” (p. 30). Almost all of the teachers believed that compared to the previous assessments, the technology in this program did save them time. Ten teachers went on to report that even with the addition of progress monitoring, the assessments were quicker with the use of technology. However, a few teachers did not share this perception. One teacher discussed having to go around the room to sync her computer and thought that it was wasting her time. When describing the program on the survey, another teacher simply wrote, “Time Consuming”. This difference in perception is consistent with perceptual theory and is based on their particular experiences with the program.

**Progress monitoring.** Reading 3D identifies the need for progress monitoring by taking the following steps: assess students; consult, analyze and discuss data; create small groups and tailor instruction; and then monitor their progress. Progress monitoring is a means to facilitate more frequent formative assessments for struggling students. It is defined as an assessment conducted in regular intervals in order to predict growth of each student and assess the appropriateness and effectiveness of an instructional program. The findings of this study indicate the effects of progress monitoring are positive and prove to be an effective element of early literacy instruction.
It is not surprising that all teachers in this study recognized the positive impact that progress monitoring has on instruction. Researchers (Ardoin & Christ, 2009; Balajthy, 2007; Hintze, Christ, & Methe, 2006; Wang, 2010) also agreed that simply meeting face to face with a student could make a difference in a child’s performance.

According to the literature, technology can provide a more effective way to monitor progress (Hintze et al., 2006). It is surprising that although all teachers recognized this fact, not every teacher was progress monitoring as often as suggested. In addition, even the teachers that were progress monitoring didn’t always use this data often enough to guide their instruction. Half of the teachers surveyed admitted to seldom using this data to guide or individualize their reading instruction.

**Individualize instruction.** Another purpose of this program is to enable teachers to determine needs and therefore individualize instruction. The existing literature (Risko, 2010) acknowledged that, “assessments can transform instruction by providing timely information that captures students’ strengths, needs, and specific instructional history” (p. 420). Eighteen teachers agreed the biggest benefit from the technology was the immediate feedback. Many researchers (Balajthy, 2007; Risko, 2010; Song, 2007) recognized the importance of immediate feedback to help guide instruction. This option was not considered in the previous paper-pencil tests and is one of the many benefits of utilizing technology in formative assessments.

Therefore, it is surprising how many teachers recognized this benefit and yet admitted that they do not always use this immediate feedback of the data to guide their discussions or
daily instruction. However, it should be importantly noted that over half of the teachers revealed that they do use the small group advisor in some capacity to help plan small group instruction for students who are below or far below proficient.

**Interventions.** The last purpose is to allow teachers to provide interventions in a timely manner. There was also a mixed message received from the teachers about interventions. Although all teachers mentioned how the technology makes the data very accessible, it was surprising that only two of the participants shared their perceptions of how this program assists with their interventions. Another teacher alluded to better interventions through the use of progress monitoring. However, if there were a specific question about interventions, there may have been more teachers input on their perspective of the impact that this new program has made on timely interventions.

**Finding 2: Technology Impact**

The second research question was: For teachers implementing Reading 3D in grades K-3, what are their perceptions regarding the implementation process of Reading 3D as it relates to the role of technology? According to Trunacle (2010), “The fast pace of technological change has caused us to reevaluate how we educate students to meet the needs of the changed workplace” (p. 45). Although the Reading 3D assessments are similar to the previously administered early literacy assessments, it introduces technology within these assessments. The TPCK framework affirms, “When technology is added to the educational environment, teachers must consider (1) how technology can be applied to enhance learning, (2) how use of technology changes what is learned, and (3) how technology can be used to
enrich the evidence of student learning” (AACTE, 2008, p. 245). Therefore I will analyze the perceptions of the impact of technology through the lens of this framework.

**Enhance learning.** Pedagogical Content Knowledge (PCK) refers to the conditions of teaching that encourages learning and connects assessment to learning (AACTE, 2008). Technology can greatly impact this connection of assessment and learning. It was a relief to see that the teachers recognized that this program links assessment to learning. Throughout this study, I found that teachers based their perceptions on past experiences, for example, comparing this program to the previous literacy assessments.

Although the TRC assessments were perceived as relatively similar to previous assessments, the results from the new assessments were automatically tabulated and therefore were perceived as easier to inform instruction and enhance their learning. The difference of the TRC is the written requirement, but this too has been utilized to help inform small group instruction.

The DIBELS assessment was a new type of assessment for most of the teachers. An enlightening insight from a teacher was that by assessing with DIBELS, this program provides strategies to help all students, not just the lowest students. It is important for teachers to consider the link between assessment and learning when using this program to assess all children.

Another addition to this program is the opportunity to enhance learning through progress monitoring. All of the teachers admitted that progress monitoring impacted their
instruction. In addition, they appreciated that the new technology used gave immediate feedback on the students who were progress monitored.

**Change content.** Technology does more than just make the data more accessible for teachers to enhance learning. Technology should also change the content that is delivered to students. Technological content knowledge refers to intelligence about how technology may be incorporated in order to offer new ways of delivering the content (Niess, 2005). Understanding the perception of how technology has impacted these assessments and their uniformity will show if the teachers might utilize the program in its entirety.

There were two perceptions on the new uniformity of literacy assessments, most of which credited Reading 3D as the means of which to change what is learned. It is the perception that if there is a way of collecting more uniform and accurate data, the content in which it is delivered may change and be more appropriate for the learners.

Most of the teachers surveyed in the county of study perceived Reading 3D as a means of increasing the uniformity of the literacy assessments. It seems that there was very little uniformity before this implementation and therefore might be the reason that there was such an excitement from the teachers about the increase of uniformity. However, when the teachers were able to discuss this in their interviews, half of them admitted that there was still opportunity for teacher error. Therefore, the content that is delivered may or may not be appropriate and, therefore, may not be purposeful or helpful instruction. It was interesting that one teacher admitted the room for error, but felt like the teachers at her school didn’t know enough about technology to even figure out how to falsify the reports.
The findings of this study are consistent with the existing literature. Many researchers (Clarke-Midura & Dede, 2010; Wang, 2008) agreed that teachers who use a variety of strategies to gather data on students allow for a more valid picture to guide classroom instruction. Most of the teachers surveyed acknowledged that this program had the potential to change the way that they teach. During the interviews, six teachers shared how their perception of teaching has changed because of the data analysis portion of this program. Nevertheless, the surveys showed that most participants rarely used the data analysis portion of the program.

In order to make a successful change in the classroom, adequate professional development must be delivered before the implementation of a new program such as Reading 3D. According to this study, an adequate amount of professional development was received on the new assessments within this program. There seemed to be a discrepancy in the training involving how to use the PlaidLet, though, in most cases, participants were able to receive hands on training, which proved to be very helpful. On the other hand, most agreed there was very little training on the online component, which involves data analysis. Teachers recommended that in order to improve the professional development, it should be ongoing and include multiple opportunities for learning.

**Evidence of learning.** Technological Pedagogical Knowledge is the awareness of that existence and potential in the range of technologies available and understanding the impact that they can have on teaching and learning (AACTE, 2008). If teachers would
embrace this new mobile technology and utilize it to its full potential, they would have evidence of student learning.

Breck (2006) suggested that technology can radically revise assessments and that “the answer lies in bringing assessments closer to the ultimate goal of learning” (p. 295). The teachers in this perceptual study showed excitement as they shared how progress monitoring gives them evidence of learning that has occurred toward the ultimate goal. For example, one teacher gave evidence that she was “able to see if the child is improving, staying the same, or moving down.” But then again it is not enough for teachers to progress monitor their students, they must be aware of the potential impact that collecting, analyzing, and using this data can have on students.

Data analysis is the number one area that still requires more training and discussion. The teachers in this study were realistic about the lack of training and knowledge that they have on how to effectively analyze data in order to impact student learning. Teachers must look at this data as evidence of learning and make educated decisions based on the needs of students.

If teachers were better able to analyze their data, there would be a better opportunity for sharing the evidence of learning with parents. In addition, Reading 3D offers a home school connection program that is designed to assist with this communication. Teachers in this study perceived this as a valuable tool and were discouraged because they understood that they were told not to use this report because the program proficiency levels did not match county proficiency levels and that may be confusing to parents.
The literature also suggested that mobile technology allows for better documentation of observations (MacDonald, 2006). All teachers recognized the potential of this impact; however, some were more focused on how their particular PlaidLet was not working. Instead of focusing on the problems of the PlaidLets, teachers need to narrow the focus to the improvement of the documentation of learning and how this impacts their student growth.

**Implications**

As with most new programs being implemented, there are benefits and challenges of the program. Klein & Sorra (1996) revealed “Implementation failure occurs when, despite this decision, employees use the innovation less frequently, less consistently, or less assiduously than required for the potential benefits of the innovation to be realized” (p. 1055). In order to be proactive against implementation failure, it is essential for educators to understand the delicacies of implementing new programs. Pressman and Wildavsky (1984) shared that “implementers must know what they are supposed to do in order to be effective” (p. 165). As the principal of an elementary school that has been chosen as a pilot school for this program, understanding the benefits and challenges of this program and similar programs is essential to ensure success. It is the purpose of this research study to reflect upon the findings and offer possible practical and theoretical implications from this study.

**Practical Implications**

According to existing research, the implementation of a program is achieved by the perception and devotion of its participants. As a principal within the district of study, I was impressed by the overall positive tones throughout the survey and interview process.
Although the teachers in this study believed that Reading 3D was a beneficial program for improving literacy and shared they would not want to go back to the “old way of doing assessments”, the findings show the program was not being implemented to its full potential. Therefore, I am proposing a few recommendations that may allow for a more in-depth implementation of mCLASS®: Reading 3D.

In order to reinforce the implementation of the program, districts must consider their plans for future professional development. According to Klein & Sorrow (1996), “A strong implementation climate fosters innovation use by (a) ensuring employee skill in innovation use, (b) providing incentives for innovation use and disincentives for innovation avoidance, and (c) removing obstacles to innovation use” (p. 1060). Professional development in literacy is already offered on a regular basis in the district, is required for all teachers, and takes educators back to the core of teaching children to read. However, teachers should also be reminded in their role in preparing children for the next level of education, not just the current grade level.

There is also a recommendation for more professional development that focuses specifically on the data analysis portion of this program. In order for teachers to be asked to regularly use data to guide instruction, teachers first must have an understanding of this portion of the program. Teachers revealed that they did not spend an adequate number of hours discussing the data within the professional arena. Therefore, it is my suggestion that this professional development be held in multiple settings in order to give teachers a deeper understanding of the program and offer numerous chances to practice and ask questions.
This will give the opportunity for the teachers to become more familiar with the tool and as a result use it on a more regular basis.

In addition, one teacher suggested that teachers only be involved in training on things that are relevant to their grade level. According to Purkey and Schmidt (1987), “Individuals tend to perceive only that which is relevant to their purposes and make their choices accordingly” (p. 30). Therefore, it is also my recommendation that this professional development include support offered to work with teachers individually or in grade level meetings.

In order to elicit more buy-in for this program, it is also a recommendation to consider receiving teacher input on countywide standards. It was questioned numerous times throughout this study why the county standards did not match program standards. It is the perception of teachers that Wireless Generation has researched literacy and its expectations and therefore they question the motives behind the difference in standards; one teacher even felt as if she was being “set up for failure”. Purkey and Schmidt (1987) shared that communication can guide perceptions. Hence, it is my belief that the teachers need an opportunity to discuss and therefore understand the change in the proficiency levels.

Lastly, I used my position within the county to dig even deeper into the results. It is my belief that teachers were asking for help throughout this study. Throughout the survey, teachers shared their needs; asking for things such as teacher assistants, progress monitoring fairies, and extra planning time. Even if more teacher assistants are provided, the teacher will still have the same amount of students to plan for and therefore, this will not be a time
saver. In addition, if we provide assistance with assessing students, teachers will still have to spend numerous hours if they are to use the data to plan for each student.

It is my interpretation that they understand the importance of the program, but they are unable to maximize the use of it due to the teacher/student ratio. I believe that if this program is going to be utilized as intended, school leaders must consider lowering the class size of all K-3 classrooms. Teachers will rise to the challenge when given the opportunity. Therefore, it is my recommendation that school leaders consider reducing the teacher/student ratio in Grades K-3.

Lastly, it is the perception of teachers that there have been many problems with the PlaidLets. For example, one teacher stated that although she had not personally had any problems with her computer, she knows other teachers who have struggled. Over half of the participants requested that they be able to use iPads with the new Reading 3D program next year. Since the perception is so negative about the technology currently used, teachers will blame technology for the reason behind not implementing the Reading 3D program as intended. In order to obtain true technology integration, the teachers must truly understand all components of the TPCK framework as equal entities. Therefore, I would recommend that the county consider allowing these Pilot I Schools to use iPads as the mobile technology to gather the assessment data from students. The teachers may choose to embrace the new technology and as a result, may better implement the program to its full capacity.
Theoretical Implications

I propose several theoretical implications from this study. Throughout the review of the literature, there were three main streams that were explored: Technological Pedagogical Content Knowledge framework, Implementation Research, and Early Literacy.

**Technological pedagogical content knowledge (TPCK).** The TPCK framework is a complex interaction among three bodies of knowledge: Technology, Pedagogy, and Content. Therefore, this program has a doubly challenging implementation. Participants must focus on learning both the technology and reading assessment aspects of this program. Teachers tend to consider technology to be a domain that is totally different from pedagogy and find it difficult to navigate between those two worlds. Instead of this dual challenge, educators should view this technology as a way to assist pedagogy by providing an easier way to collect and analyze reading assessment data.

Therefore, it is my recommendation to train the teachers in such a way that they will perceive the technology offered by this program as a benefit to their teaching; the biggest benefit being the immediate disbursement of data and the impact that it should have on instruction. An additional benefit is that technology often makes it easier to ensure validity and consistency. Perception is a primary component in human behavior (Purkey & Schmidt, 1987), therefore it is my recommendation to educate teachers on the benefits that technology brings and this should change their perception and, hopefully, their behavior.

**Implementation research.** Many researchers agreed that educators should not assume that just because a program is adopted, it would be implemented as intended
(Desimone, 2002; Klein & Sorra, 1996; Mills, et al., 2000). In an attempt to improve student achievement in reading, new programs such as mCLASS®: Reading 3D continues to be implemented in schools.

Preuss (2007) suggested that, “if there is a staff member or program in need of immediate assistance, run and provide the necessary assistance. But then learn from the experience and reflect upon its cause and seek to remove its roots in order to eliminate or reduce the possibility of its happening again” (p. 11). Therefore, it is my recommendation that educators continue to closely monitor the implementation of new programs. When there is a need for assistance, it is our duty to address that need and learn from our practice so that we can improve the education of our children.

**Early literacy.** Early literacy intervention is a widely discussed educational concern. According to McNamara (2007), “The assessment of reading comprehension is a critical part of designing and implementing programs that teach reading strategies” (p. 107). For that reason, there is a need to reflect on the impact that programs have on student achievement. Risko (2010) believed that, “Assessments can transform instruction by providing timely information that captures students’ strengths, needs, and specific instructional history” (p. 420). Although no perception is really ever fully understood (Purkey & Schmidt, 1987), it is believed that the teachers in this study understand the connection and should have insight in how this program is expected to impact literacy instruction.

In addition to monitoring the implementation of new programs, it is also our duty to make the connection between these programs and student achievement. Early literacy is the
beginning to all aspects of education; therefore, it is our responsibility to understand the perspective of teachers and then make the necessary adjustments to ensure student learning.

**Implications for Future Research**

One of the findings in this study was the lack of utilizing the data in its full capacity to help guide instruction. In accordance with the literature, future studies should examine the reliability of decisions based on progress monitoring (Ardoin & Christ, 2009) which is supported in the design of each assessment. They went on to share that future studies should consider the complexity of the selections used in progress monitoring before making instructional decisions that impact students. As such, it would be beneficial to investigate the reliability of the assessments before using this assessment as its main support to guiding instruction.

Future studies in the arena of literacy should also include a larger sample size. As the number of school facilities implementing Reading 3D grows, it will be much easier for a future research study to have a larger pool of participants. Although a smaller sample size allowed me to study participants in greater depth, a larger variety of perceptions from teachers could also benefit the educational venue. I also recommend that the sample include the principals and other staff members conducting assessments, so the data gathered will be representative of the entire implementation of the program, not just from the perspective of the teacher.

When evaluating program implementation, the evaluator should assess whether the program is reaching the appropriate population or if its service delivery is consistent with
program expectations (Preuss, 2007; Rossi, Lipsey, & Freeman, 2004). Although this study investigated if the program was being implemented as intended, it did not focus on whether or not it was reaching students as intended. A future study should examine the impact that this program is having on student achievement. The educational setting could benefit from understanding the impact that this program has on teaching and learning.

Limitations

As in any study, there are limitations. The main limitation to this study is that I have worked at each of the three sites that were observed. In fact, I was previously an administrator at one site, but I made a strong effort to remain aware of my personal knowledge about the site and program. This could be a possible limitation of this study; however, precautions were taken to ensure the fidelity of this study and I used this knowledge to enhance the study. During the research phase of this study, I listened carefully to each participant. I tried to remove myself from the study and take careful notes on uniform protocols to ensure validity. After the information was recorded and transcribed, a peer evaluator was also used to compensate for this limitation.

In addition to these precautions, I also eliminated one school as a site of observation because it is where I am currently serving as principal. Bogdan and Biklen (2007) stated that, “principals should not study teachers in their own school as part of their dissertations unless they can guarantee that the teachers’ cooperation is authentic” (p. 49). In this study, the participants in the other three schools were selected based on teachers who quantitatively demonstrated whether or not they were implementing the program with fidelity. Since I have
no power over the participants, the teachers should have given their authentic perceptions as a teacher.

According to Keefe and Jenkins (1984), “The principal who is committed to instructional leadership must participate directly in the key operational aspects of program planning, implementing, and evaluation” (p. 41). By conducting this study, I was able to show all participants my perspective on the importance of evaluation of the implementation of this program. By doing this study and emphasizing the purpose of this study, I hope to persuade teachers to give their honest opinion of the implementation of this program.

In addition, the purpose of this study is solely to gather information about the teachers’ perceptions of the implementation of mCLASS: Reading 3D. In no way will the teacher be evaluated with any of the data collected. This study will in no possible way impact subsequent evaluations of teacher performance. Furthermore, only teachers’ perceptions were explored. The perceptions of principals and other staff members conducting assessments were not examined, so the data gathered may be biased toward teachers’ perceptions and not representative of the entire implementation of the program.

The research design was crucial and the data collection methods chosen in this qualitative study had limitations. Administering a survey in a qualitative study has its risks. First, there is not an opportunity to directly observe the implementation of a program. Edmonson & Irby (2008) cautioned that there is not an opportunity to dig deeper into responses when only a survey is conducted. In addition, you are unable to clarify to the participant the meaning of each question and the possibility of an invalid survey arises. In
addition, participants tend to elaborate more when talking than in writing. In an effort to counteract this limitation, I also interviewed eight of the participants to gather a deeper understanding of the perceptions of teachers on the implementation of Reading 3D.

Lastly, generalizability should be considered in a stratified random sampling (Patton, 2006); however, the limited sample size of this study could affect the applicability of the findings. Palmquist (2006) argued that small sample size runs the risk of circumstantial results. However, Yin (2003) communicated that the smaller number of participants will result in a more in-depth study, which will ultimately impact the field of study. It is also suggested that there can be limitations based on selectivity of participants (Patton, 2002). Within the parameters of this study, other districts and school leaders may be able to learn from these findings but the study’s findings are not strictly generalizable to all other districts.

**Acquired Points of Interest**

Throughout the duration of this study, there were numerous points learned. First of all, the program mCLASS ®: Reading 3D has the potential to change the way teachers teach by using data analysis. In order for this change to occur, school leaders will have to seriously consider smaller class sizes. As described in the practical implications, although teachers are excited about how this program could revolutionize early literacy instruction because of the automatic access to data, they are struggling with how to manage the logistics of the program. As a school leader within this district, I plan to brainstorm a variety of ways to assist teachers with this struggle and then share with other principals as appropriate.
I also realized that when conducting independent research in studies such as this one, it is hard to ever really feel finished. For example, throughout this process, I kept identifying different studies that would be helpful for other districts implementing this program. I would like to have a list of helpful hints from teachers on how to best manage different aspects of the program such as benchmarking at the end of the year during EOGs or how to best involve parents in the learning process by using the data from the Home Connection. As a result, I will continue to research this program in order to ensure maximum achievement growth of our students.

Another point of interest comes from the theoretical implications. In addition to monitoring the implementation of new programs, I am also going to begin shifting my focus more to the connection of any new program to increased student achievement. Historically, I have taken on new programs and monitored them closely to ensure high implementation, however, in the future; my goal is to limit the programs being implemented to only those that are directly linked to student achievement.

Chapter Summary

The key findings for this perceptual study were developed from an in-depth study from teachers in one rural county. This data was gathered in an effort to answer the following research questions:

1. What are the teachers’ perceptions of the implementation of the Reading 3D program?
2. For teachers implementing Reading 3D in grades K-3, what are their perceptions regarding the implementation process of Reading 3D as it relates to the role of technology?

The findings of the teachers’ perceptions were primarily analyzed through the lens of TPCK with a secondary interest in perceptual theory. In addition, I offered implications of those perceptions. As in any research, there are limitations, however, I took several precautions to ensure the validity of this study. Although the findings from this study would not be considered generalizable, the findings would be deemed useful to other rural counties who are implementing mCLASS®: Reading 3D. Moving forward with the mCLASS®: Reading 3D program, I will meet with the Board of Education in this county to share the recommendations offered as a result of this study.
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APPENDICES
APPENDIX A

Determining Composite Scores in the ABCs Model

Note for 2004-05: ELP (Economic, Legal, and Political Systems) and U.S. History EOC (End-of-Course) Tests are NOT included in the ABCs computations. Writing is not included in growth or performance in 2004-05.

In the ABCs, a school’s growth and performance are summarized using composite scores. There are two types of composite scores: growth, and the performance composite.

There are two growth composites—one for expected growth and one for high growth. These growth composites summarize a school’s growth over all grade levels and subjects included in the accountability model. The two composites indicate whether or not a school makes expected or high growth, respectively. The growth composite scores allow a school to fall short of expected or high growth in some areas but exceed it in others and still reach the growth standard overall. If the expected growth composite equals or exceeds zero, the school achieves the goal of expected growth. Similarly if the high growth composite equals or exceeds zero then the school makes the goal of high growth.

The performance composite summarizes the percent of students in a school who have test scores at or above Achievement Level III (consistent mastery of subject/course content matter) in the subjects tested. Students who took End-of-Course (EOC) tests prior to grade 9 are included in their high school’s performance composite in their 9th grade year.

The performance composite and the expected growth composite are used when determining which schools may need special assistance (i.e., Priority schools and Low-Performing schools). A school with an expected growth composite that is negative (less than zero) and a performance composite less than 50 (fewer than 50% of scores were at Level III or above) is identified as a low-performing school.

The process for determining composite scores manually, using the accountability formulas, follows. Necessary constants and parameters are summarized in this document. Keep in mind that ABC Tools software, provided to all LEAs by the Division of Accountability Services, performs these calculations automatically. Documents (Setting Annual Growth Standards: The Formula, and EOC Prediction Formulas) that explain the formulas used in the ABCs model can be accessed at http://abcs.ncpublicschools.org/abcs/
## APPENDIX B

### Survey Protocol:

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td>Female, Male</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>Under 30, 30-39, 40-49, 50-59, 60+</td>
</tr>
<tr>
<td><strong>Current Grade Level</strong></td>
<td>K, 1, 2</td>
</tr>
<tr>
<td><strong>Years Teaching in Current Grade Level</strong></td>
<td>1, 2, 3, 4, 5, 6+</td>
</tr>
<tr>
<td><strong>Total Years Teaching Experience</strong></td>
<td>0-2, 3-5, 6-10, 11+</td>
</tr>
<tr>
<td>Please indicate type of early literacy assessments you</td>
<td>GCS Assessment, DIBELS, RR, DRA, Benchmark, ClassScape</td>
</tr>
<tr>
<td>administered prior to Reading 3D:</td>
<td></td>
</tr>
<tr>
<td>Please indicate how much training time was provided to you for the</td>
<td>Less than 1 hour, 1-3 hours, 4-6 hours, 7+ hours</td>
</tr>
<tr>
<td>use of Reading 3D assessment on the PlaidLet:</td>
<td></td>
</tr>
<tr>
<td>Please indicate how much training time was provided to you for the</td>
<td>Less than 1 hour, 1-3 hours, 4-6 hours, 7+ hours</td>
</tr>
<tr>
<td>use of data analysis provided from mclasshome.com:</td>
<td></td>
</tr>
<tr>
<td>Please indicate below how often you use the activities included in</td>
<td>Daily, Weekly, Monthly, Rarely, Never</td>
</tr>
<tr>
<td>mclasshome.com for reading instruction:</td>
<td></td>
</tr>
<tr>
<td>Please indicate below how much time on average each week you spend</td>
<td>Less than 1 hour, 1-3 hours, 4-6 hours, 7+ hours</td>
</tr>
<tr>
<td>discussing results of your electronic assessment results with others:</td>
<td></td>
</tr>
<tr>
<td>(this may include your grade level team, other instructional planning</td>
<td></td>
</tr>
<tr>
<td>teams, an instructional specialist, or your administrator)</td>
<td></td>
</tr>
<tr>
<td>Please respond to the following open-ended questions:</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Describe in your own words the new diagnostic reading assessment program, mCLASS ®: Reading 3D.</td>
<td></td>
</tr>
</tbody>
</table>

| Describe how you think technology has impacted the use of mclass ®: Reading 3D. |

<p>| Do you feel you are highly qualified to administer these new assessments? Why or why not? |</p>
<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>How are Reading 3D assessments similar to or different from assessments you used prior to Reading 3D?</td>
<td></td>
</tr>
<tr>
<td>Do you use progress monitoring and benchmark data to guide your literacy instruction? If so, please explain:</td>
<td></td>
</tr>
<tr>
<td>What are the challenges that you have encountered during the use of Reading 3D?</td>
<td></td>
</tr>
</tbody>
</table>
What are the benefits that you have encountered during the use of Reading 3D?

What support do you still need to help you better utilize the features of the mCLASS ®: Reading 3D program?

😊 Thank you for your honesty in completing this survey! 😊

If selected, would you be willing to participate in a 45-60 minute one-on-one interview at a scheduled time of your convenience?

___ No. I am not interested in participating in this study.

___ Maybe. I would be interested in hearing more about the time involved in participating in this study. Please email me at ______________________.

___ Yes. Please email me at ________________________ with more details.

Thank you for your valuable time and input into this study.
Melody Wilson
NC State University
### APPENDIX C

**Progress Monitoring Fidelity on TRC**

**By Teacher**

<table>
<thead>
<tr>
<th>Districts:</th>
<th>School:</th>
<th>Teacher:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Grade:</th>
<th>All Grades</th>
</tr>
</thead>
</table>

**Subject: Official Class**

<table>
<thead>
<tr>
<th>Student enrollment and PM status as of Now*</th>
<th>TRC Progress Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-11 MOY -&gt; EDY</td>
<td>All Rate</td>
</tr>
</tbody>
</table>

*Refresh date: 06/01/2011

#### To School

- Far Below...
  - Below Prof. 
  - Proficient
  - Above Prof...

- Far Below...
  - Below Prof. 
  - Proficient
  - Above Prof...

- Proficient

---

#### To Week

- Far Below...
  - Below Prof. 
  - Proficient
  - Above Prof...

- Far Below...
  - Below Prof. 
  - Proficient
  - Above Prof...

- Proficient

---

#### To Grade

- Far Below...
  - Below Prof. 
  - Proficient
  - Above Prof...

- Far Below...
  - Below Prof. 
  - Proficient
  - Above Prof...

- Proficient

---

#### To Ethnicity

- Far Below...
  - Below Prof. 
  - Proficient
  - Above Prof...

- Far Below...
  - Below Prof. 
  - Proficient
  - Above Prof...

- Proficient

---

**Percentages**:

- 0%
- 20%
- 40%
- 60%
- 80%
- 100%

---

**Note:** Situations with no data are not included.

---

**Wireless Generative**
Correlation/Effectiveness on mCLASS: Reading 3D
By Teacher For, NC

Districts:
School:
Teacher:

Grade: All Grades
Subject: Official Class

To School
To Grade
To Ethnicity

Students who were Far Below Proficient in 10-11 - MOY

Students who were Below Proficient in 10-11 - MOY

Students who were Proficient or Above Proficient in 10-11 - MOY

*Refresh date: 05/21/2011
*Refresh date: 06/21/2011

Institutions with no data are not included.
APPENDIX D

Teacher Interview Protocol:

1. Describe in your own words the new early literacy assessment program, mCLASS ®: Reading 3D. (Possible Follow Up: What types of technology are included in this program?)

2. Describe the impact that this technology has had on the Reading 3D program.

3. Which professional development activities have you attended to prepare you to use this technology? How would you describe the training activities you were involved in to use both the PlaidLet and the online component of the reading assessment program? What other types of trainings have you attended that have helped you in technology use?

4. What part of the professional development was most effective for you? Why do you think this is so?

5. What can be done to better prepare classroom teachers to use this new early literacy assessment system?

6. In your opinion, has technology impacted the uniformity of early literacy assessments?

7. What formal or informal communication, such as meetings or discussions, has occurred to support you in the use of Reading 3D data? How do you use the student reports generated by the mclasshome.com website?

8. Can you describe a specific example of how the use of technology in this program has made a specific change in your instruction?

9. Overall, do you think that the implementation of Reading 3D has been successful? Why or why not?

10. Is there anything else you would like to share with me regarding your experience with Reading 3D?
APPENDIX E
North Carolina State University
INFORMED CONSENT FORM for RESEARCH

Title of Study: Exploring Teachers’ Perceptions of the Role of Technology in the Implementation of mCLASS®: Reading 3D

Principal Investigator: Melody Wilson  Faculty Sponsor: Lance Fusarelli, Ph. D.

What are some general things you should know about research studies?
You are being asked to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate or to stop participating at any time without penalty. The purpose of research studies is to gain a better understanding of a certain topic or issue. You are not guaranteed any personal benefits from being in a study. Research studies also may pose risks to those that participate. In this consent form you will find specific details about the research in which you are being asked to participate. If you do not understand something in this form it is your right to ask the researcher for clarification or more information. A copy of this consent form will be provided to you. If at any time you have questions about your participation, do not hesitate to contact the researcher(s) named above.

What is the purpose of this study?
The purpose of this study is to understand how teachers perceive the role of technology in the implementation of a reading assessment program called mCLASS: Reading 3D. This study will also examine how teachers perceive that role of technology in the fidelity of implementation of the program.

What will happen if you take part in the study?
If you agree to participate in this study, you will be asked to complete a survey. This survey will also ask if you are interested in participating in an interview. If you indicate that you are willing to participate in an interview the researcher will access data about you on the mCLASS fidelity reports and then may contact you about an interview. Your total time commitment would be less than two hours over a course of one survey and one interview. The survey will take place at your school in a staff meeting and will last approximately 15 minutes. The interview will take place at your school at your convenience and will last between 45–60 minutes. I anticipate completing the Survey and interviews in early November.

Risks
While it is not the intent of the investigator to ask intrusive questions, some participants may have a higher level of sensitivity to revealing information than anticipated. The majority of
the information gathered is self-disclosed and gives participants a high degree of control over what information is shared with the investigator. The interview questions will focus on the implementation of Reading 3D. The process of participation may instigate some feeling of discomfort or uncover past emotional pain. You are encouraged to inform the researcher at any time if you would like to withdraw from the study.

Benefits
There are no known benefits to you for participating in this study. However, the information gained from this study could then be used to improve existing implementation and professional development of mCLASS ®: Reading 3D.

Confidentiality
The information in the study will be kept confidential. Data will be stored securely in the researcher’s private residence and will not be associated by school name or individual name with your specific response. No reference will be made in oral or written reports, which could link you to the study. After a professional transcriber transcribes your interview, these records will be kept on the researcher’s computer. The data collected in the study will be published in the researcher’s doctoral dissertation for North Carolina State University.

Compensation
You will not receive any compensation for participating in this study.

What if you have questions about this study?
If you have questions at any time about the study or the procedures, you may contact the researcher, Melody Wilson at mtwilson@ncsu.edu.

What if you have questions about your rights as a research participant?
If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Deb Paxton, Regulatory Compliance Administrator, Box 7514, NCSU Campus (919-515-4514).

Consent To Participate
“I have read and understand the above information. I have received a copy of this form. I agree to participate in this study with the understanding that I may choose not to participate or to stop participating at any time without penalty or loss of benefits to which I am otherwise entitle

LEA Consent signature __________________________  Date ________________
Investigator's signature ________________________  Date ________________
APPENDIX F
Sample Home School Connection Report

County Schools
Elementary

mCLASS® Literacy Progress Report

1st Grade, Middle-of-Year Assessment

Kelley's progress toward becoming a skilled reader

The mCLASS Reading 10 assessment results show how your child's skills compare with the skills exhibited by other students in the same grade across the county. This comparison helps us learn exactly how we need to support individual students as they grow into successful readers.

Your child is on the road to reading success but behind where he or she needs to be. Together, we can help your child continue to grow and reach her revised reading goals.

Right now, we want to help improve these key reading skills:
- Hearing and using sounds in spoken words (Phonemic Awareness)
- Knowing letter sounds and sounding out written words (Alphabetic Principle)
- Reading words in stories easily, quickly, and correctly (Accuracy and Fluency)

In kindergarten, there is no grade level expectation in terms of reading connected text. For understanding throughout the year, however, children who are familiar with the alphabet and letters names at the beginning of first grade are more likely to become successful readers.

By the end of first grade, your child should be reading beginning-level stories and books completely and sounding out simple words such as "went" and "because."

Where do I get additional information if I have questions?

If you have questions or concerns about your child's performance, please contact your child's teacher or school.

Is there anything I can do to help my child?

Please see the second page of this letter for some activities you and your child can do to help develop reading skills.
mCLASS® Literacy Progress Report
1st Grade, Mid-Year Assessment

Activities for Parents and Children

These are activities you and your child can do together to help practice and improve your child's reading skills. We have recommended these activities based on your child's most recent DIBELS Benchmark scores.

Focus skill(s):
Reading words in stories easily, quickly, and correctly (DIRP)

1. Model fluent reading for your child.
   - Read aloud, remembering to read accurately and expressively.

2. Read with your child.
   - Take turns reading parts of a story or poem. Turn the story into a reader's theater. Have family members read character parts.

Other skills for your child to practice:
Hearing and using sounds in spoken words (PSF);
Knowing letter sounds and sounding out written words (NW1)

3. Help your child count the number of sounds in words.
   - Have your child find pictures of two- and three-sound words. Put the same number of markers (coins, blocks, etc.) as phonemes (sounds) under the picture. Have your child trace a different marker as he or she says each sound. Some ideas for pictures are: fly (3 sounds), tip (3 sounds), shoe (2 sounds), and the number five (3 sounds).

4. Help your child take spoken words apart and put them together.
   - Have your child listen for syllables in words.
   - Have your child help you prepare a box with different objects. Invite your child to pick an object and then clap the number of syllables in the object's name.
   - You can play this game in the grocery store. Have your child clap the number of syllables in the name of each item as you put it in your shopping basket.
   - Have your child separate the sounds in words, listening for beginning and ending sounds. (Example: mom: /m/ /əʊ/ /m/)
   - Ask your child to blend sounds together to make a real word. Say several words, one sound at a time. (Example: /kn/ /eɪ/ /p/ — sheep, /t/ /əʊ/ /d/ — sit, /st/ /əʊ/ /d/ — nut, /lj/ /əʊ/ /d/ — joke, /t/ /l/ /aɪ/ /t/ — fight)

5. Give your child a sheet of paper and dictate the items on your grocery shopping list.
   - If your child requests the correct spelling, write the words for your child to copy, or spell the words as he or she writes them. You can also allow your child to use inventive spelling for items on the list and locate the correct spelling at the grocery store.

6. Help your child practice reading and writing letters and words.
   - Help your child form words using magnetic letters.
   - Use masking tape and a permanent marker to label names of objects in your home, such as bed, doll, table, chair, and curtain. This will help your child recognize letters and the names of everyday objects.

7. Help your child practice reading and producing text.
   - Point out the letter-sound relationships your child is learning on food labels, boxes, newspapers, magazines, and signs.
   - Practice letter sounds together.
   - Practice writing and reading letters and words.

We are working hard to ensure that your child's development is on target for success, and we thank you for your efforts at home. Together, we will help your child become a successful reader.
APPENDIX G
Sample Small Group Advisor Report
# APPENDIX H
Sample DIBELS Benchmark History Report

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## Summary

### Middle Benchmark

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