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A Survey of Teachers' Beliefs Regarding the Importance and Implementation of
Formative Assessment

A Proposed Dissertation

Presented for the

Doctor of Education

Degree

The University of Mississippi

Diane Lowry

August 2011

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Abstract

This quantitative study examined teachers' beliefs of the importance and implementation of formative assessment in one north Mississippi school district. There is a limited amount of research related to teachers' beliefs of formative assessment. Heritage, Kim, Vendlinski, and Herman (2009) defined formative assessment as a planned process during instruction. This process involves collecting information throughout instruction and providing feedback to the student and the teacher and results in changes to instruction to meet the needs of the learner.

The purpose of this study was to determine the mean scores, standard deviations, and percentages of teachers' responses to survey items concerning the importance and implementation of formative assessment based on grade levels taught and years of experience. Teachers ($n = 77$) from two schools in a north Mississippi school district completed the survey consisting of questions pertaining to the importance and implementation of formative assessment. Descriptive statistics were employed to analyze each item on the survey. The findings indicated that teachers' beliefs based on the importance and implementation of formative assessment varied according to grade levels taught and years of experience.

DEDICATION

This dissertation is dedicated to my husband, Ken, for his unwavering support, patience, and his faith in my abilities throughout our marriage of 32 years. I would have never completed my doctoral degree without his continuous love and encouragement during this journey. I would also like to thank my daughters, Kate and Kristen, for the unconditional love and support.

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CHAPTER 1

Introduction

Assessment has been the centerpiece of various educational reforms for over 50 years (Cizek, 2010), and assessment is a key component of effective instruction (William, 2010). The intention of assessment is to determine whether students learned the content and mastered the intended goals (William, 2010). Despite the intention of assessment, teachers' proposed goals of instruction might be different from what students learn. Even though the purpose of assessment is to assess students' mastery of the goals, the current assessments focus on accountability for student achievement (Baker, 2007).

Baker (2007) noted that accountability for student learning is a universal issue, which has become a critical issue concerning educational policies. The No Child Left Behind Act (NCLB) of 2001 led to an emphasis on accountability for student learning (Shepard, Hannaway, & Baker, 2009; Yell, 2006), which is the "most invasive and complex federal legislation in our nation's history" (Nichols & Berliner, 2007, p. 7). The importance of NCLB has resulted in standardized testing becoming the main source of information for assessing student learning (McManus, 2008).

Recently, the emphasis on standardized testing has shifted toward the importance of classroom assessment for improving student achievement (Cizek, 2010). The reason for interest in classroom assessment and away from standardized testing is that classroom assessments provide teachers with daily assessment data (Stiggins, 2007), which are essential

for making instructional decisions. As a result, the well-researched classroom assessment approach, called *formative assessment*, has surfaced as a possible tool for implementing effective instruction and ensuring educational reform (Guskey, 2010).

The seminal work by Black and William (1998) established the power and potential of formative assessment to improve student learning. Therefore, discussing this body of research is imperative for determining the goal of formative assessment. The researchers reviewed 250 journal articles related to formative assessment, and the results of this meta-analysis showed an effect size that ranged from .04 (moderate change) to .07 (larger change). These findings provided conclusive evidence that formative assessment is a viable tool for improving student learning (Black & William, 1998). Black and William reported that formative assessment is a necessary tool for classroom assessment, which can improve student achievement. Subsequent studies (Campos & O'Hern, 2007; Ruiz-Primo & Furtak, 2006; Stiggins, 2008; Zimmerman & Dibeneditto, 2008) have clearly validated their claim.

The purpose of formative assessment is to improve student learning through the process of assessment and instruction (Baker, 2007; Black & William, 1998). Formative assessment requires teachers to gather information related to student learning and adjust or modify instruction to meet the needs of the learner (Cizek, 2010; Popham, 2008). Popham (2008) suggested that formative assessment is the cornerstone for designing instruction, which provides the basis for reliable and meaningful effective instruction (Popham, 2008). Recently, Cizek (2010) reported that formative assessment is the best approach to classroom assessment and, if effectively implemented, could improve student achievement.

Importance of Formative Assessment

Assessment and accountability are critical issues at the national and state levels (Stiggins, 2007). Current policymakers have recognized the limitations of standardized testing (summative assessment) for increasing student achievement. Formative assessment has gained attention as an approach to instruction and assessment, which improves student achievement (Cizek, 2010). The idea that formative assessment has the potential to increase student learning came to the attention of President Obama (Herman, Osmundson, & Silver, 2010). Consequently, in April of 2010, the Council of Chief State School Officers (CCSSO) and the National Governors Association met to discuss the concern for “high-quality assessments” (National Governors Association and Council of Chief State School Officers, 2010, p. 1). The concept of high-quality assessments is part of the U.S. Department of Education’s educational initiative, “The Race to the Top Assessment Program” (Herman et al., 2010).

This program provides \$350 million to states for the development of high-quality assessments. One requirement of the implementation of sound assessment programs is formative assessment. This is the first time in the history of education that a federal program has supported any kind of assessment approach. According to Herman et al. (2010), formative assessment is the best classroom assessment approach for improving student achievement, and the usefulness of formative assessment is contingent upon effective implementation of this approach (Cizek, 2010). It is clear that formative assessment may improve student learning; thus, it is necessary to identify the implementation practices of this approach.

Implementation of Formative Assessment

The implementation or practice of effective formative assessment involves a systematic method of evaluation and instruction (Bloom, Hastings, & Madaus, 1971). The process of formative assessment incorporates opportunities for teachers to analyze student learning during instruction or “on-the-fly” assessments (Heritage, 2007, p. 144). Using assessments more often or “moment-by-moment” can promote learning with understanding (Heritage, 2007, p. 144). Assessments considered on-the-fly or moment-by-moment evaluations are informal or formal assessments, respectively. These assessments, either planned or unplanned, can determine a student’s level of understanding of the content.

Building on Heritage’s work, Moss and Brookhart (2009) considered formative assessment as the collaboration between the teacher and student, which first includes clearly defined objectives. Second, the teacher and student work together throughout the process of instruction and assessment to gather information with the intention of improving student achievement. Third, the objective of this process is to allow teachers and students opportunities to change instruction while learning is forming, rather than at the end of instruction (Marshall, 2008; Moss & Brookhart, 2009; Popham, 2008).

Brookhart and Nitko (2007) noted that formative assessment is a continuous process that changes instruction with the intention of improving student learning. The idea that teachers and students work together to uncover any misconceptions promotes learning with understanding and closes the achievement gap (Marshall, 2008). As a result, the learning process is intensified and can improve learning for all students (Moss & Brookhart, 2009). In conclusion, formative assessment has the potential and possibility to be an effective classroom approach, which could increase student achievement (Shepard, 2005).

The components of the promising classroom-based tool are critical for ensuring the proper implementation of this approach to instruction and assessment. Sato, Wei, and Darling-Hammond (2007) provided a framework for the effective implementation of formative assessment based on various studies, which showed that formative assessment results in increased student achievement. From this comprehensive review of research, the components of formative assessment emerged. The components included the use of varied quality assessments along with feedback, clearly defined appropriate goals, and modifications of teaching based on assessment results. These components provide the framework of formative assessment.

Teachers' Beliefs

For the purpose of this study, the term *teachers' beliefs* are used to describe teachers' self-perceived perceptions of the importance and implementation of formative assessment. Research suggests teachers' beliefs are critical components for ensuring educational reform (Pajares, 1992). Teachers' previous teaching experiences influence their current practices (Spillane, Reiser, & Reimer, 2002).

The success or failure of formative assessment concerns the classroom teacher and relates to teachers' beliefs in instruction and assessment practices and their implementation (Moss & Brookhart, 2009). Teachers' beliefs concerning the way students learn, as well as their instructional practices, develop over time, first as a student and then as a teacher (Pajares, 1992; Schreiber, Moss, & Staab, 2007). For example, a student who performed poorly on comprehensive tests may then form the belief that comprehensive tests do not effectively measure student learning. Teachers' prior experiences as a student can influence the grade level they decide to teach (Schreiber, Moss, & Staab, 2007). This may relate to

positive or negative experiences the teacher had as a student. For example, a teacher may decide to teach third grade because of the positive experiences that occurred while in the third grade.

Given the research which suggests that previous experiences shape teachers' beliefs, one might assume that a teacher's years of experience change teachers' beliefs. According to Wolters and Daugherty (2007), a teacher's level of confidence regarding instruction and assessment practices are directly related to that teacher's number of years of experience. Teachers with more years of experience expressed higher levels of confidence in their ability to incorporate assessment and instructional practices, which benefitted all learners. Fives and Buehl (2010) added to Wolters and Daugherty's study. Five and Buehl's research found that elementary school teachers showed stronger beliefs in their abilities to engage students compared to middle and high school teachers. These studies suggest that grade levels taught can influence a teacher's beliefs regarding instruction and assessment.

Purpose of the Study

The purpose of this quantitative study is to investigate teachers' beliefs in the importance and implementation of formative assessment in one north Mississippi school district. In addition, this study determined whether differences exist between years of experience and grade levels taught, according to teachers' beliefs in the importance and implementation of formative assessment.

Statement of the Problem

Experts in the field of formative assessment have not clearly articulated its definition (Marzano, 2010; McMillan, 2010; Popham, 2008), and that lack of clarity may influence teachers' perceptions of it. As a result, teachers' implementation of formative assessment is

inconsistent (Many & Jakicic, 2006). One possible explanation for the dissimilarity between research and practice may be attributed to the complex components of formative assessment (Sato, Wei, & Darling-Hammond, 2007, 2008). Inconsistent implementation and the complicated components of formative assessment may be the reason that current assessments are marketed and labeled as formative assessment (Marzano, 2010, Popham, 2008).

Marzano (2010) noted that assessments advertised as formative assessments undermine the objective of formative assessment. These assessments marketed as formative assessments may really be interim assessments (Marshall, 2008; Popham, 2008). Interim assessments periodically identify students that are not mastering the state academic standards. The aim of formative assessment is to assess students' progress while learning is still forming (Heritage, 2007), rather than sporadically evaluate student achievement.

Many districts use interim assessments to identify students who may not perform well on standardized tests, which is not the purpose of formative assessment (Popham, 2008). Formative assessment occurs during instruction, and the assessment results provide information regarding the students' progress toward the learning outcomes. The results generated from the ongoing, frequent, and varied assessments allow opportunities for the teacher and student to change instruction toward mastering the targeted objectives.

Teachers' beliefs influence their instruction and assessment practices according to grade levels taught and years of experience (Fives & Buehl, 2010; Tschannen-Moran & Woolfolk Hoy, 2007). Hence, this study reports teachers' beliefs in the importance of and how often formative assessment is used. The results of this study may determine whether differences exist between years of experience and grade levels taught, according to teachers' self-reported beliefs of the importance and the implementation of formative assessment.

Research Questions

This study will address the following research questions:

1. What are the means, standard deviations, and the percentages of the teachers' responses to the items on the survey concerning the importance of formative assessment based on grade levels taught?
2. What are the means, standard deviations, and the percentages of the teachers' responses to the items on the survey concerning the importance of formative assessment based on years of experience?
3. What are the means, standard deviations, and the percentages of the teachers' responses to the items on the survey concerning the implementation of formative assessment based on grade levels taught?
4. What are the means, standard deviations, and the percentages of the teachers' responses to the items on the survey concerning the implementation of formative assessment based on years of experience?

Definition of Terms

Assessment. Assessment is a planned activity, which includes information regarding students' understandings and misunderstandings of the targeted content (Marzano, 2006).

Formative assessment. Heritage et al. (2009) defined formative assessment as a planned process during instruction, which collects information throughout instruction and provides feedback to the student and the teacher.

Dimensions of formative assessment. Sato et al. (2007) defined the dimensions of formative assessment as an outline for the practice of formative assessment, which involves the purpose of classroom assessment. The dimensions provide a framework for formative

assessment, which describe the methods teachers use daily to promote students' understanding of the content and mastery of the goals.

Interim assessment. Interim assessment is a term often confused with formative assessment. According to Perie, Marion, and Gong (2007), the purpose of interim assessments is to assess students three to four times a year to identify deficit areas. The evidence gathered from the interim assessments allows teachers opportunities to design instruction to meet the needs of the student according to the deficits.

Standardized testing. Eggen and Kauchak (2007) stated that standardized testing involves assessments that evaluate a large number of students using specified guidelines and procedures.

High-stakes testing. Marchant (2004) defined high-stakes testing as standardized tests with ramifications for the student or the teacher.

Adequate Yearly Progress (AYP). Abedi (2004) referred to AYP as an annual report provided to the U.S. Department of Education, which reports students' progress toward the state standards.

Significance of the Study

Assessment and accountability for student learning are critical issues at the national and state levels (Stiggins, 2007). Current policymakers have recognized the limitations of standardized testing (summative assessment) for increasing student achievement. Formative assessment has gained attention at the both the national and state level as an approach to instruction and assessment that can improve student achievement (Cizek, 2010).

Millions of dollars in grant money are available for school districts to develop state assessments that support instruction and assessment (Herman et al., 2010). The intention of

this effort is to promote quality classroom assessments to improve student achievement through the implementation of effective formative assessment practices. Research suggests that formative assessment is the greatest tool for the future for improving student learning (Cizek, 2010). However, research centered on teachers' beliefs in the importance of formative assessment as an approach for improving student learning is limited (Cizek, 2010; Herman, Osmundson, Ayala, Schneider, & Timms, 2006). Research also reveals there are a limited number of teachers who implement formative assessment effectively (Heritage et al., 2009; Leung & Mohan, 2004; Popham, 2008; Sato et al., 2007, 2008; Shepard, 2005), which may be connected to teachers' understanding of this approach.

Although research concerning years of experience and grade levels taught is widespread (Wolters & Daugherty, 2007), research that focuses on grade levels taught and years of experience as they influence teachers' beliefs in the importance and implementation of formative assessment is limited. This study sought to address current research concerning teachers' practices of formative assessment.

Limitations

1. The findings of this study are limited to the accuracy and perception of teachers who complete the survey.
2. The survey may not assess teachers' beliefs in the importance and implementation of formative assessment.

Delimitations

1. The participants of the study are 77 teachers from one north Mississippi school district, which may not be representative of teachers in all school districts across the nation.

2. Convenience sampling was used to select the sample population, which may not represent other teachers in north Mississippi.

Organization of the Study

This study consists of five chapters, references, and appendices. Chapter 1 provides an introduction of this study, the statement of the problem, the research questions, definitions of terms, limitations, delimitations, and the significance of the study. Chapter 2 is a review of literature relevant to formative assessment. Chapter 3 provides the methodology, research design, subjects, instrumentation, and procedures for this study. Chapter 4 contains an analysis of the results. Chapter 5 presents a summary of the study and provides recommendations for future research.

CHAPTER 2

Review of Literature

This chapter contains six sections; the first section provides the history of assessment. The next section describes the relationship between the dimensions of formative assessment and the mastery learning theory. The third section includes the theoretical perspective of the social cognitive theory associated with years of experience and grade levels taught. The fourth section describes a review of research related to formative assessment. The fifth section reviews literature centered on teachers' beliefs. The final section examines the challenges that exist with the use of formative assessment.

Recent History of Assessment

In the 1900s, the industrial revolution and the evolution of assessment changed the educational system in the United States (Kauchak & Eggen, 2008). Industry was a central issue in the nation during this time. As a result, Frederick Taylor introduced the principles of scientific management (Shepard, 2000). The core of these principles maximized the efficiency and standardization of all industries and influenced the educational system in the United States. High-stakes testing emphasized the principles of scientific management, which resulted in accountability for learning.

Accountability Era

In the 1930s, school districts became responsible for student learning, which resulted in the development of the Scholastic Aptitude Test (Stiggins, 1999). In addition, publishers developed achievement tests using a multiple-choice format. Hence, textbook publishers began creating workbooks and worksheets to teach the skills needed to pass the achievement tests.

During the 1970s and early 1980s, accountability for student learning moved to the state level with the development of state assessments and minimum competency tests (Haertel & Herman, 2005). The public's opinion regarding education was the focus, and attention toward high school graduates' inability to read or write was paramount. A wave of concern centered on ensuring students' acquisition of knowledge, and the focus was on student accountability. The minimum competency tests consisted of multiple-choice questions and often required students to pass these tests in order to graduate from high school.

The focus on accountability, standardized testing, and improvement in student learning reached a peak with the passing of NCLB in 2001 (Yell, 2006). This legislation was the reauthorization of the Education and Secondary Education Act of 1965 (ESEA). The purpose of this legislation was to ensure that school districts and schools make AYP and that all children become proficient in reading and mathematics by the 2013–2014 school year. The intention of NCLB was to ensure quality classroom teaching, which improves student achievement. However, according to Haertel and Herman (2005), focusing on testing rather than on providing students with a clear understanding of the content has resulted in test-based curriculums.

Summative Assessment

Standardized testing is a category of assessment called summative assessment (Black & William, 1998; Cizek, 2010; McManus, 2008). McManus (2008) suggested that standardized assessments or summative assessments provide a “snapshot of where students are at a given point in the year” (p. 10). Accountability for student learning is the primary purpose of standardized testing. Bloom et al. (1971) described summative assessment as a method of evaluation at the end of the semester. They believed that summative assessment includes grades. The critical element of summative assessment is to determine the effectiveness of teaching and learning of the educators, the students, or the program of study after teaching and learning has taken place.

Perie et al. (2007) clarified and categorized the definition of summative assessment. They believed that standardized testing is a method of summative assessment. Standardized testing and summative assessments have similar characteristics, one of which is evaluating student learning at the end of the year or at the end of a semester.

Stiggins (2008) clarified Perie et al.’s (2007) definition of summative assessment and stated that accountability for student learning is the purpose and intention of summative assessments. In addition, summative assessments include standardized tests and classroom assessments (Perie et al., 2007). Fisher and Frey (2007) argued that classroom summative assessments judge students’ skills and knowledge after instruction. Equally important is that summative assessments assign grades and determine students’ standing in the class (Cizek, 2010). To summarize, assessment after learning and measuring students’ performance based on grades dominate the method of assessments used in classrooms today (Heritage, 2007; Moss & Brookhart, 2009). However, assessments that evaluate students’ performance during

instruction are necessary for determining the effectiveness of instruction. Therefore, educators, school districts, and policymakers should consider the use of formative assessment as an effective approach to instruction and assessment.

Formative Assessment

Scriven (1967) coined the terms *formative* and *summative* but used the word *evaluation* rather than assessment. McManus (2008) noted that various researchers describe the elements of formative assessment differently. Bloom et al. (1971) expanded Scriven's (1967) definitions of formative evaluation. Their research described this term as part of mastery learning theory. Sadler (1989) suggested required feedback as well as self-monitoring, the first researcher to do so, and indicated that feedback contributes to the acquisition of the outcomes for students and promotes students' self-esteem.

Stiggins (2007) supported the research by Sadler but suggested that assessment of any type begins with shared learning objectives between the teacher and student. Stiggins indicated that formative assessment should be part of the process of teaching and learning and provided students with examples of the targeted objectives. In addition, formative assessments should allow self-assessments and peer assessments. The idea that formative assessment involves the use of self-assessment and peer assessment, which promotes feedback to students regarding their progress, was a new concept.

Stiggins (2008) broadened Popham's (2008) concept of formative assessment and advocated that teachers need both summative and formative assessment. Assessment for learning happens in the classroom to support the learner and promote student achievement (Stiggins & Chappuis, 2006). Hargreaves (2005) described formative assessment as a method for monitoring students' performance against targets or objectives.

Popham (2008) elaborated on the elements of formative assessment and recommended that formative assessment must include opportunities for students and teachers to adjust instruction. Popham further explained that in order for assessment to be formative, it should guide instructional decisions, which results in modifications in teaching and learning made by the teacher or student. Moreover, feedback provides the teacher and student with information regarding their progress (Guskey, 2010). In summary, the definitions and components of formative assessment are inconsistent (Popham, 2008).

Theoretical Perspective

The purpose of formative assessment is to provide information regarding the student's learning, which helps teachers change classroom instruction rather than depend on standardized testing to improve student learning (National Governors Association and Council of Chief State School Officers, 2010). Informing instruction is consistent with the dimensions of formative assessment outlined by Sato et al. (2007, 2008). Sato and her colleagues reviewed multiple studies (Black & William, 1998; Butler, 1987; Crooks, 1988; National Research Council, 2001; Stiggins, 1994; Stiggins & Chappuis, 2006; Wiggins & McTighe, 1998) and developed the components of formative assessment; these center on brain research, effective instruction, and assessment practices.

As a result, Sato et al. (2007) developed six dimensions of formative assessment. These dimensions, based on research associated with the National Board Teaching Standards, explicitly describe the essential elements to promote quality formative assessment in the classroom. They articulate the various functions of assessment as part of classroom instructional practices.

The approaches advocated by Sato et al. (2008) provided teachers with the necessary guidelines needed for effective formative assessment.

The dimensions are listed as follows:

1. Views and uses of assessment
2. Teachers' range, quality, and coherence of assessment method
3. Clarity and appropriateness of goals and expectations for learning
4. Opportunities for self-assessment
5. Modifications to teaching based on assessment information
6. Quality and appropriateness of feedback to students (Sato et al., 2008, p. 673)

These dimensions connect to Bloom et al.'s (1971) mastery learning theory. Bloom and his colleagues' perspective of the elements of formative assessment provided the basis for the dimensions of formative assessment. They recognized the benefits of formative assessment as a viable assessment tool, which has been used in the classroom for the past 40 years. Bloom and his colleagues completed a study that examined the influence the classroom teacher has on student learning. The result was the development of the mastery learning theory.

Guskey stated, "Mastery learning is a philosophically-based approach to teaching and learning" (Guskey, 2001, p. 104), which recognizes that students learn differently and their rate of learning varies according to the needs of the learner. This theory consists of strategies for teaching and learning, which include understanding the students' prior knowledge and developing a plan that considers the needs of the learner. In addition, teachers need to sequence instruction, monitor student learning, provide corrective feedback, and promote opportunities for students to deepen their understanding of the content.

The mastery learning theory aligns to the dimensions of formative assessment delineated by Sato and her colleagues (2008). Figure 1 identifies the elements and dimensions of formative assessment. The first dimension (teachers' views and uses of assessment) is consistent with the mastery learning theory because Bloom et al. (1971) purported that teachers need to use assessments for obtaining information regarding students' mastery of the intended objectives.

The second dimension recommends that teachers use a range or multiple assessments throughout instruction. The mastery learning theory suggests that teachers use varied assessments, which pinpoint learning deficits and determine mastery (Bloom et al., 1971). These assessments center on providing quality assessments according to the needs of the learners, including students' prior knowledge. Understanding students' prior knowledge reveals the learners' readiness to understand and link their previous knowledge to the new concepts.

The third dimension (clarity and appropriateness of goals and expectations for learning) aligns with the mastery learning theory. Bloom et al. (1971) contended that teachers should assess students' prior knowledge and use this information for designing instruction. Determining students' prior understanding of the concepts ensures mastery of the targeted objectives as well as through assessments administered before, during, and after instruction. Bloom et al.'s mastery learning theory and Dimension 3 are similar because both focus on clear, appropriate goals as well as designing instruction centered on students' prior knowledge.

The fourth dimension (opportunities for self-assessment) connects to the mastery learning theory through the use of student-selected activities. This theory recommends

opportunities for students to work independently or within a cooperative learning group (Bloom et al., 1971). This approach to teaching and learning encourages students to work collaboratively under the supervision of the classroom teacher to extend their knowledge and understanding of the content.

The fifth and sixth dimensions (modifications to teaching based on assessment information and quality and appropriate feedback) parallel the mastery learning theory through the implementation of modifications generated from feedback. The feedback used in the mastery learning theory provides corrective information for the student and teacher. According to Marshall (2008), teachers need to review students' unit assessment results and change instructional planning before moving to the next unit. The mastery learning theory recommends that teachers reteach any skill or concept to all students who have not mastered that skill or concept. The students must achieve 80% to 85% of the unit's overall outcomes before beginning the next unit to ensure overall retention of the skills and concepts. Popham (2008) supported this concept and suggested that teachers predetermine mastery levels by whole-class and individual learning needs of the students. The teacher identifies the level of mastery, which determines the next step of instruction.

The sixth dimension focuses on the quality and appropriateness of feedback to students (Bloom et al., 1971). The teachers share the learning goals with the students and the assessment data uncovers the students' prior knowledge of the concepts and skills. Thereby, the design of instruction centers on learners' needs, which facilitates learning with understanding. Figure 1 is a visual representation comparing the dimensions of formative assessment as described by Bloom et al. (1971) and Sato et al. (2007, 2008).

Figure 1

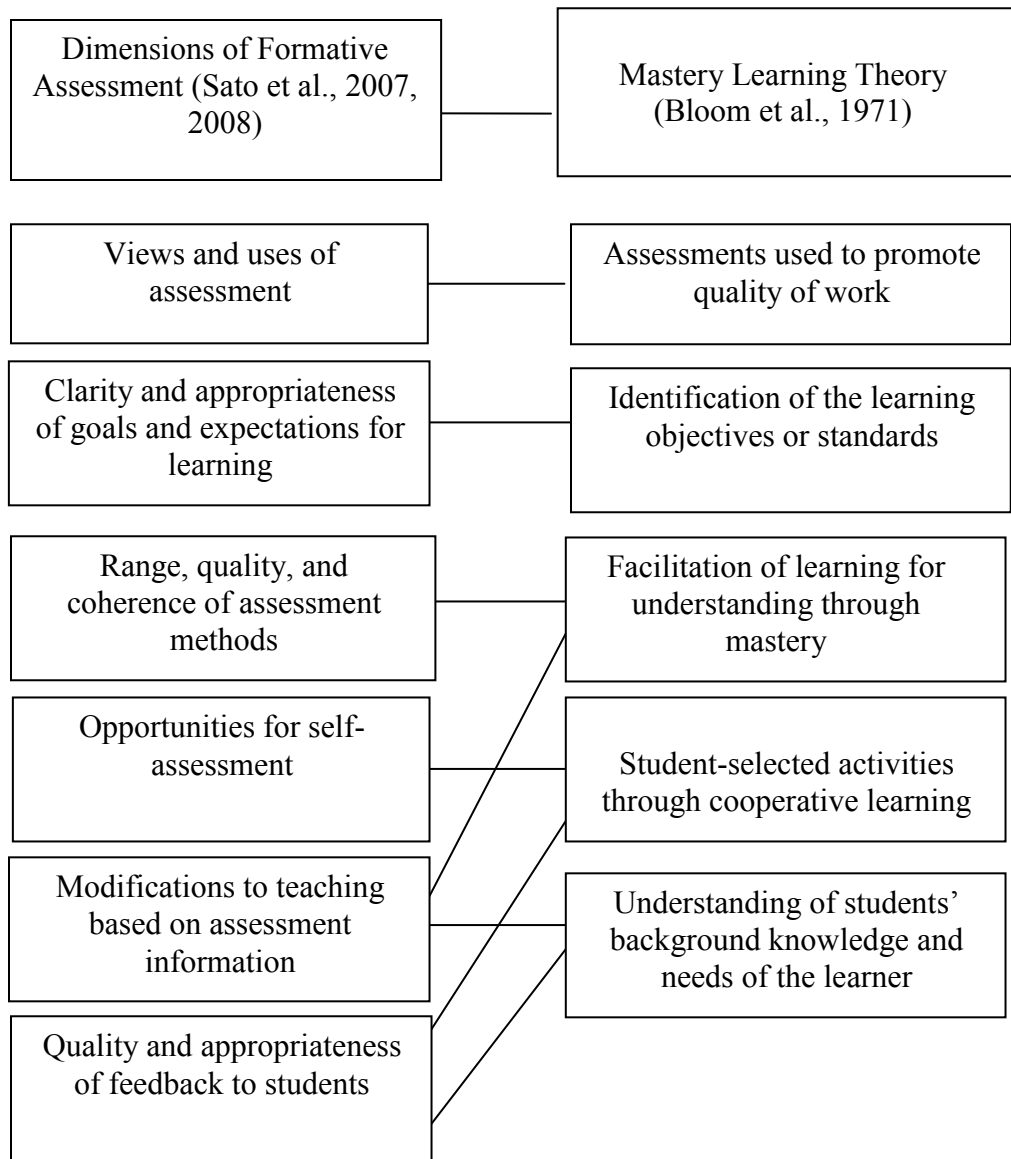


FIGURE 1. This theoretical framework of formative assessment links Bloom et al.'s (1971) mastery learning theory, which supports teaching and learning connected to the dimensions of formative assessment outlined by Sato et al. (2007, 2008).

Social Cognitive Theory

The research questions considered in this study link to the social cognitive theory through teachers' personal beliefs related to grade levels taught and years of experience. Kauchak and Eggen (2008) suggested that the "social cognitive theory tells us that people tend to imitate behavior that they observe in others and also that individuals are more likely to imitate someone with high status than someone with low status" (p. 207). Tschannen-Moran and Woolfolk Hoy (2007) reported, "Social cognitive theory suggests that personal factors (including self-efficacy beliefs) and behaviors interact with the environment to influence each other" (p. 945). Thus, teachers' grade levels taught as well as years of experience can affect teachers' beliefs related to the importance and practice of formative assessment.

The basis of the social cognitive theory is that individuals learn from others (Woolfolk, 2011). Woolfolk (2011) further explained that teachers influence one another through interactions. According to Bandura (1997), there are four major components which can shape an individual's beliefs. The first component is an individual's mastery experiences (Bandura, 1997, p. 3). People's beliefs concerning their abilities to master the desired outcomes are dependent on their successes and failures in reaching the intended goal. Successes foster a higher sense of their ability to obtain the desired goal or objective. However, if an individual experiences failure while attempting to achieve the intended goals or objective, that individual can become discouraged. The theory that individuals' beliefs can change according to their experiences is applicable to the classroom teacher as well.

Teachers who possess positive mastery experiences are more persistent even when students struggle in their classroom (Bandura, 1997). Thus, a teacher with more experience may be more likely to persevere despite obstacles. This occurs because teachers with more

experience believe in their abilities, and they may use varied instructional and assessment practices to promote student achievement. In contrast, a teacher with fewer years of experience may give up if a student is unable to grasp the concepts, which may result in that student not meeting the state standards.

The second component is “vicarious experiences” (Bandura, 1995, p. 3), which might strengthen, undermine, or decrease a teacher’s self-efficacy beliefs. Vicarious experiences occur when a teacher observes another teacher achieving his or her intended objectives, which can promote a strong sense of self-efficacy. However, teachers can be discouraged when they observe others failing.

Vicarious experiences could change a novice teacher’s belief in the importance of implementation of a particular teaching method (Bandura, 1997). For example, if a novice teacher observes an expert teacher implementing an effective teaching method, then the novice teacher may change her teaching methods to align with the expert teacher. The influence of a teacher’s vicarious experiences may alter a teacher’s beliefs related to the number of years of experience as well as grade levels taught.

A teacher with several years of experience and a teacher considered an expert teacher may influence a teacher with less experience or a novice teacher. For example, an experienced expert teacher who implements clear learning objectives, which is consistent with formative assessment, may cause a novice teacher to begin to implement this approach. The novice teacher recognizes that clearly articulated objectives promoted student learning for the expert teacher. Therefore, the novice teacher models the same behaviors as the expert teacher to ensure student achievement in her classroom. However, negative vicarious experiences can influence a novice teacher if an expert teacher is easily frustrated when her students struggle

academically or behaviorally. As a result, teachers' grade-level contemporaries may positively or negatively influence each other.

Bandura's (1995) third major component that influences an individual's sense of self-efficacy is "social persuasion" (p. 4). Teachers may perceive other teachers teaching the same grade level as being capable of mastering the desired outcomes. Teachers with less experience may be encouraged by experienced teachers to problem solve a difficult situation. However, coworkers can reduce a teacher's sense of self-efficacy through negative comments that question a teacher's ability to accomplish the outcomes. This action affects a person's desire or motivation to keep trying to achieve the goal, which affects the acquisition of the goals or objectives. Teachers' grade levels of instruction and the number of years of experience may change a teacher's sense of self-efficacy through social persuasion in the form of positive or negative feedback.

The fourth component focuses on altering self-efficacy beliefs by reducing stress (Bandura, 1995). Individual's perceptions of their abilities or capabilities related to their levels of stress are dependent on various components. A teacher's perception of the "difficulty of the tasks" (Bandura, 1995, p. 5), as well as the effort the teacher puts forth to achieve those tasks, is important components. Teachers' desire to complete a task relates to "their physical and emotional state at the time, the amount of external aid they received, and the circumstances surrounding the task" (Bandura, 1995, p. 5). Teachers' stress levels influence their personal beliefs in their abilities, which can result in positive moods or negative moods. Teachers with a high sense of self-efficacy are able to think about their successes, which results in positive attitudes toward difficult situations (Bandura, 1993).

However, teachers with a lower sense of self-efficacy envisage situations that result in failure, which causes them to consider only the negative aspects or all the things that can go wrong.

In summary, teachers' beliefs can vary according to the grade levels taught and years of experience (Fives & Buehl, 2010). Thus, teachers may influence their colleagues vicariously, through social persuasion and by demonstrating mastery of an approach or method. In addition, physiological stress may affect teachers' self-efficacy beliefs. Moreover, clarifying the components or dimensions of formative assessment is essential in determining how teachers implement formative assessment.

Research Related to Formative Assessment

A study by William, Lee, Harrison, and Black (2004) investigated 24 secondary students in six different schools in England. The teachers in the experimental group participated in one day of training on four elements of formative assessment. The four elements included specific learning objectives shared with the students, self-assessments, teacher questioning, and feedback. The teachers in the control group did not receive training on formative assessment and did not implement the four elements of formative assessment into their classroom practice. The results indicated that teachers using the four elements of formative assessment yielded a mean effect size of .34 on the postassessment, compared to no significant difference on the postassessment for students in the control group.

Research by Sato et al. (2008) supported William et al.'s (2004) research. This three-year study of 16 middle school teachers investigated whether National Board Certified teachers used formative assessment more than those teachers who are not National Board Certified. The researchers collected evidence from both groups, including students' work, and videotaped teachers' lessons, some of which incorporated formative assessment and some

that did not. Both groups completed an online survey, which compared teachers' demographic information to their beliefs regarding the practice of formative assessment.

The National Board Certified teachers participated in focus groups to determine whether their beliefs regarding formative assessment changed over time. These teachers received professional development training on the elements and practice of formative assessment. As the findings showed, the National Board Certified teachers' instructional practices changed compared to the teachers that were not National Board Certified. One difference between the groups involved teachers' beliefs in their ability to increase student learning through the practice of formative assessment. These teachers reported that analyzing student work daily, which is part of the process of formative assessment, helped them identify changes needed to improve instruction. The modifications in instruction helped these teachers strengthen their instruction and assessment practices. In addition, the teachers stated that the implementation of formative assessment improved their relationship with the students, which resulted in motivated learners. In addition, the National Board Certified teachers stated that analyzing student work assisted them in understanding the state standards. As a result, these teachers integrated these standards more frequently into their instruction and assessment practices (Sato et al., 2008).

Another aspect of this study included students of both certified and noncertified teachers. The students of both groups were surveyed and the responses examined. The students whose teachers were part of the National Board Certified group reported that their teachers provided clearly defined objectives as well as the requirements needed for mastery of these objectives. In addition, the teachers offered detailed explanations during class discussions.

The National Board Certified teachers altered their instruction and assessment practices to include cooperative learning, peer assessment, and self-assessment. As a result, the students who had these teachers reported that these methods of instruction and assessment helped them understand the content. The students whose teachers were not National Board Certified reported no changes in their instruction and assessment practices during the three-year study.

Both groups completed an online survey, which consisted of the instruction and assessment practices focused on formative assessment. The findings showed that students whose teachers were part of the National Board Certified group rated them higher for providing clear objectives, including ungraded assessments and quality feedback, compared with the teachers who were not National Board Certified. The mean rating for the National Board Certified teachers was higher for the instruction and assessment practices related to formative assessment compared to no changes for the other group. The overall impact of this study was the change in the teachers' beliefs concerning the purpose, need, and impact formative assessment can have on the teacher as well as the student.

Zimmerman and Dibenedetto (2008) echoed Sato et al.'s (2008) belief regarding explicit learning goals and suggested that teachers should provide specific outcomes to guide students through the process of learning. The Zimmerman and Dibenedetto (2008) study selected a high school in Tennessee near the Mississippi River because this school integrated formative assessment through a collaborative approach.

This school had an enrollment of 886 students, with 40% of the students eligible for free or reduced lunch. The entire school structured the formative assessment process by evaluating the students after each unit of study. This school indicated that mastery

represented a score of either an 80 or higher (Zimmerman & Dibenedetto, 2008). If a student did not achieve this level, the teacher would modify instruction for the student and reteach the skills not mastered until the student demonstrated mastery of the intended objectives. The teachers and students were interviewed to determine whether this approach changed their perceptions of learning as well as whether students' standardized test scores improved. The teachers reported that their students became more engaged in the learning process by asking more questions and their grades improved. Students stated that they were excited about learning and doing better in school.

Overall, this high school earned national recognition by the United States Department of Education in 2006 for its academic achievements. The students scored in the top 10% on the standardized tests. The findings from this study showed that implementing formative assessment using a collaborative model resulted in an increase in student motivation and improved academic success as measured by standard testing.

Stiggins and DuFour's (2009) investigated the theory of implementing assessments through a collaborative approach, which added to Zimmerman and Dibenedetto's (2008) study. This schoolwide approach included three levels of assessment. The first level was the classroom level, which provided information to the teacher and student regarding the students' progress toward the intended outcomes. The second level was the school level, which consisted of collaborative assessment teams. Each team developed common formative assessments to monitor the students' understanding of the defined outcomes. Next, the team members worked together, explained common assessment results, and brainstormed for ways to respond to students struggling with outcomes. The school created a plan to provide additional time and intensive support for the students struggling to meet the objectives.

The third level of Stiggins and DuFour's (2009) research was the instructional level, which informed school leaders and policymakers of the students' current levels of performance evidenced by mastery of the state standards. In addition, community members received copies of the targeted objectives. The purpose for communicating these objectives was to promote collaboration among the school district, policymakers, and within the community. As a result, local policymakers and businesses provided additional funding, which was an unexpected benefit. Another benefit was an increase in student achievement measured by standardized testing. The findings from this study support the use of clear and appropriate learning goals and expectations. Sharing the targeted learning objective and mastery toward these goals resulted in the community and the community leaders providing additional funds and materials. These additional resources assisted in the ultimate goal of improving student achievement as measured by state testing.

In the spring of 2004, 40% of the third-grade students in the Snow Creek School met proficiency in reading compared to the state average of 71%. Two years later, 96% of the same students met proficiency in reading. In addition, the math proficiency for the same group of students jumped from 70% to 100% during that same time period (Stiggins & DuFour, 2009, p. 642).

Another component of formative assessment is self-assessment (Andrade & Cizek, 2010; Bloom et al., 1971; Cizek, 2010; Moss & Brookhart, 2009; Sato et al., 2008; William et al., 2004). Andrade and Cizek (2010) suggested that students should monitor their own learning. Bloom et al. (1971) said that the use of self-assessment includes opportunities for students to correct their own work. Moss and Brookhart (2009) explored this concept further and explained that the use of self-assessment encourages students to become "self-regulated

learners” (p. 82). Self-regulation and self-assessment require students to examine their own work throughout the process of teaching and learning (Andrade & Cizek, 2010).

Joseph (2010) stated, “Successful students at all grade levels are self-regulated learners who assess their knowledge and examine their cognitive processes” (p. 100). Developing students’ ability to think using metacognitive thinking strategies is significant for all learners. Jacobs (2003) stated that all teachers should teach metacognitive strategies to encourage thinking skills. Teaching metacognitive strategies and self-assessment and self-regulating learning are components of formative assessment (Heritage, 2007; Sato et al., 2007, 2008; Stiggins, 2008). Self-assessment can include using reflective journals and self-evaluation and identifying students’ prior knowledge, which involves quality feedback.

Andrade, Du, and Wang (2008) explored the significance of self-assessment to promote effective writing skills. The participants of this experimental study included 116 elementary school students in the third and fourth grades. The researchers provided the treatment group a model of an exemplary writing sample. The treatment group developed the criteria for the necessary components of effective writing based on the “6 + 1 Trait Writing Method” (p. 6). Members of the treatment group analyzed the components of this writing method and assessed their own writing using self-developed rubrics. The results indicated that the experimental group had higher mean writing scores than the control group (Andrade et al., 2008).

The quality of feedback is an important element in formative assessment as well as for fostering learning with understanding (Cizek, 2010). Black and William (1998) recommended the use of varied assessments providing feedback to the teacher and learner. Feedback from classroom discussions, observation, samples of student work, and homework

supplies information to adapt instruction to meet the needs of the learner. Bloom et al. (1971) incorporated the idea of feedback through their mastery learning theory. The integration of corrective feedback identifies which students need more instructional time to master the intended objectives.

Herman and Choi (2008) suggested that effective formative assessment correlates with the teachers' abilities to interpret assessment results, which provides quality feedback to the student. The study investigated 10 middle school teachers' use of formative assessment strategies with a sample population of 25 fourth- and fifth-grade science teachers. This qualitative research included observations with the participants to determine whether journals are a viable tool for implementing the components of formative assessment. The teachers used the journals to identify the learning objectives, monitor student learning, adjust instruction, and provide corrective feedback.

Teachers with students who earned higher scores between their pretest and posttest results also received higher correlation coefficient scores. Teachers with a correlation coefficient of 0.93 on their abilities to analyze students' pretest results also had the highest gains in student performance on the posttest (Herman & Choi, 2008). The results suggested teachers' abilities to analyze pretest results accurately helped to provide clearer feedback to the students, which resulted in better lesson plans (Herman & Choi, 2008). Preparing a detailed lesson plan provides a framework for instruction. In addition, the lesson plan needs to include possible misconceptions the students may have regarding the content. Finally, teachers need ongoing assessments that measure student learning in order to modify instructional plans and promote learning with understanding.

Aschbacher and Alonzo (2006) explored the use of science journals and notebooks to monitor students' understanding of the concepts compared to multiple-choice tests. The sample population of this study involved 25 Grades 4 and 5 teachers participating in professional development concerning pedagogical strategies for assessing and monitoring student learning through the use of student journals. This qualitative study included teacher observations and interviews and ongoing professional development support. The 25 classes consisted of $N = 245$ students with $n = 77$ of the teachers participating in professional training (PT). The PT teachers implemented journals or notebooks to evaluate students' knowledge and skills of the content. The remaining regular teachers (RT; $n = 168$) did not take part in the training and implemented multiple-choice tests to assess students. In addition, professional development training demographic information concerning the teachers' number of years were analyzed to determine whether teachers with more experience used the information gathered during professional development training more than less experienced teachers. The number of years of experience ranged from 0–25, with an average of 13 years of experience. There was not a significant difference between the number of years of experience and posttest scores of the PT or RT groups.

Students in the PT and RT classes were administered a multiple-choice pretest and posttest of the science content. The findings showed inconsistencies among the PT classes. Some of notebook scores in these classes aligned to the posttest scores, but others did not. One explanation given was differences in teachers' implementation of the journals and notebooks. The notebooks or journals were analyzed and patterns emerged. Some of the teachers failed to provide clear feedback to the students and did not document students' progress throughout the process. Other teachers required the students to copy the correct

answers without requiring them to justify their responses. This resulted in the students not having a deep understanding of the concepts. Some teachers provided ongoing questioning, promoted higher order thinking, kept detailed accounts of the students' progress, and adapted instruction based on the data. It was concluded that notebooks or journals can be an instructional approach for monitoring students' understanding, which provides evidence of the changes needed to promote student learning.

Many and Jakicic (2006) noted that teachers' use of formative assessments lacked consistency and continuity. Cizek (2010) concurred and noted that challenges exist with classroom practice of formative assessment, which includes teachers' perceptions of this practice. According to Popham (2008), one possible explanation of the low level of implementation lies in teachers' erroneous beliefs regarding the practice of formative assessment. Teachers often believe that formative assessment is a test, rather than part of the ongoing process of instruction and assessment. Therefore, a possible precursor for the development of sound and effective formative assessments is in the hands of the classroom teachers' conceptual understanding of this approach, which can be a challenge.

Teachers' Beliefs Concerning Teaching and Learning

Research suggests that teachers' personal beliefs regarding teaching and learning shape their conceptual understanding of classroom assessments (Earl, 2003). In addition, designing instruction and assessment should be intertwined and always evolving. As a result, teachers' perceptions of classroom assessment can influence their instruction and assessment practices. Teachers must recognize that learning is not a linear process as well as understand that assessment does not always occur at the end of teaching and learning.

Research on Teachers' Beliefs

A study by McNair, Bhargava, Adams, Edgerton, and Kypros (2003) focused on teachers' beliefs related to formative assessment practices. The participants included 157 teachers in prekindergarten to Grade 4. The researchers separated the grade levels into two groups. Prekindergarten to second-grade teachers were in Group 1; Group 2 included third- and fourth-grade teachers. These two groups of teachers responded to open-ended questions that related to teachers' assessment methods and reported how often pencil-and-paper tests were part of their instruction. In addition, the teachers documented students' progress using pencil-and-paper tests and observations. The teachers did not change instruction according to the information gathered from these sources. Moreover, the observational data collected focused on behavioral objectives rather than academic objectives. The findings revealed that 92% of the teachers in Grades 3 and 4 used paper-and-pencil tests. However, 16% to 20% of the teachers in prekindergarten to Grade 2 used paper-and-pencil tests. In addition, 95% of the teachers in the prekindergarten grades included formative assessment methods in their classroom practices, compared to 88% of the teachers in Grades 3 and 4.

A study by Hargreaves (2005) surveyed 83 teachers about their beliefs regarding assessment with open-ended questions. The study centered on teachers' perceptions of the terms assessment and learning. The findings indicated that a majority of teachers believed that assessment comes only at the end of instruction. In addition, the teachers felt that assessment is not part of instruction, which is inconsistent with the components of formative assessment.

A study by Brown (2004), which concurred with Hargreaves' (2005) study, surveyed 525 teachers and principals in New Zealand. The survey consisted of 50 items divided into

specific domains related to teachers' perceptions of classroom assessments. One domain focused on school accountability, while another addressed student accountability, and the last examined teachers' self-efficacy beliefs regarding assessments as being irrelevant to teaching and learning. The teachers reported that assessments should be used for school accountability, but they disagreed that student accountability should confirm the success of the school. The participants generated a list of 11 tasks, which they considered assessments. The tasks provided by the participants included the following: teacher-made tests, standardized tests, worksheets, students' self-assessments, and peer assessments.

The results of Brown's (2004) research showed that teachers considered a variety of tasks as assessments. However, the teachers were not able to distinguish between summative and formative assessments. As a result, they were not able to sort the forms of assessments into the subcategories of summative and formative. The study also examined the relationship between the demographic data of the teachers and their perceptions of classroom assessments.

The demographic information examined included teachers' age, grade level, school location, and the socioeconomic makeup of the schools' population. The results did not indicate a significant difference between the list of tasks identified as assessments and their demographic information. However, the findings indicated that teachers could not determine whether the tasks were formative or summative assessments (Brown, 2004).

Building on Brown's results (2004), Yap and her contemporaries (2008) reported that 34% of middle school teachers could not accurately interpret state standards. Additional findings suggested that teachers were not able to articulate the learning outcomes as measured by the assessments. Also, the tests measured low levels of cognitive understanding and did not include higher order thinking skills.

Another study of elementary school teachers, by Boardman and Woodruff (2004), argued that the emphasis on standardized testing has affected teachers' beliefs and abilities to learn a new instructional approach to teaching reading. They found that "teaching in a 'high-stakes' assessment environment impacts the implementation, fidelity, and sustainability of new teaching methods" (p. 545). Furthermore, the pressure to raise students' standardized test scores impacts teachers' instructional practices and their ability to address the diverse learning needs of students (Assaf, 2008). In addition, standardized testing jeopardized teachers' individuality because of the added responsibilities and pressures associated with it.

Teachers' Beliefs and Years of Experience and Grade Level

Research concerning teachers' years of experience in relation to teachers' beliefs shows varied results (Wolters & Daugherty, 2007). Teachers' years of experience arguably should suggest that teachers with more experience have a strong belief in their ability to improve student learning; however, results from studies over the last decade differ. A study completed by Migley, Feldlaufer, and Eccles (1988) indicated that teachers with more experience are more likely to control and distrust students, compared to teachers with less experience.

Another study completed by Woolfolk and Hoy (1990) reported that preservice teachers had a strong belief in their abilities during their student teaching; however, their belief in their ability decreased during the first years of teaching. This change may be the result of the teachers' grade level taught. Research supports the belief that there is a relationship between a teachers' grade level taught and years of experience. A study by Tschannen-Moran and Woolfolk-Hoy (2001) argued that teachers' beliefs regarding instructional practices, student involvement, and classroom management changed quickly for

beginning teachers but began to stabilize over time and with more experience. The participants of this study included 225 graduate school teachers. Forty percent of the participants taught elementary school, 29% middle school, and 31% taught high school. The findings showed there was no relationship between teachers' beliefs and grade levels taught. In other words, vicarious persuasion suggested by Bandura (1995) does not change teachers' beliefs of the following constructs: (a) instruction, (b) student engagement, (3) and classroom management. However, the relationship between these constructs and the number of years of experience does influence teachers' beliefs. The results showed higher means and standard deviations for all three constructs in relationship to years of experience compared to teachers with less experience.

Goddard, Hoy, and Woolfolk-Hoy (2004) added to this but focused on teachers' beliefs compared to grade levels taught. This study investigated the relationship between early childhood teachers' perceptions compared to elementary, secondary, and teachers of higher education. The findings from this research reported that early childhood teachers felt more in control of their learning environment compared to the other grade levels taught. One possible explanation may be because early childhood teachers' instructional practices are less formal, which could promote confidence in their ability to manage the classroom. Teachers' beliefs may differ according to their grade level taught and years of experience, which could be an obstacle for the proper application of formative assessment.

A study of graduate students by Darling-Hammond (2000) contradicted previous research by Woolfolk and Hoy (1990), suggesting that 96.4% of the graduates "reported feeling well or very well prepared for teaching" (Darling-Hammond, 2000, p. 99). A study by Palmer, Stough, Burdenski, and Gonzales (2005) did provide evidence that the number of

years of experience affects teachers' beliefs. Palmer and his colleagues reviewed these studies related to teacher beliefs, and the results suggested that years of experience do influence teacher effectiveness. However, Palmer suggested that these results were inconsistent.

A recent case study by Achinstein, Ogawa, and Speiglman (2004) investigated the teachers' beliefs during the first year of teaching. This study examined teachers' beliefs compared to the grade levels and years of experience from two different school districts. The purpose of this research was to determine whether teachers who applied for teaching positions in a district had similar philosophical beliefs as that district based on the teachers' previous educational experiences. In addition, the study examined the effects years of experience had on recently hired teachers.

Achinstein and her colleagues (2004) followed two teachers from two different districts for 2 years to learn how the structure and socialization of the school district influenced their sense of self-efficacy. District A recruited from the local community college, and many of the new hires were minorities. This district emphasized "structure, routines, and control" and preferred teacher-scripted programs (p. 587). The new teachers in this district attended schools with strict guidelines and routines and reported a preference for scripted or structured reading programs. This district also had a higher percentage of its students from a lower socioeconomic background who received free or reduced lunch.

District B recruited teachers from local prestigious universities and several teachers were Nationally Board Certified. This district emphasized originality and problem-solving skills (Achinstein et al., 2004). The student population included low socioeconomic students as well as a middle and upper class population.

District A expenses per student were 20% less than District B and provided few opportunities for professional development training. To promote inquiry learning, the new teachers in District B had to teach higher order thinking skills. The administration required lesson plans that challenged and engaged the students. In addition, the principal explained to the new teachers that they were professionals and emphasized that a “good teacher can empower students to lead richer lives with literacy” (Achinstein et al., 2004, p. 573).

Standardized test results indicated that 8% of the schools in District A met the accountability criteria established by the state; however, in District B, 80% of the schools met the accountability criteria established by the state. District A focused on adhering to instructional programs that restricted creativity. District B employed various strategies to meet the needs of all learners and provided more professional development training. This study highlights the importance of socialization, which includes how teachers perceive themselves, the school district, and their expectations for the future (Achinstein et al., 2004).

A study by Wolters and Daugherty (2007) reported that teachers with more experience are likely to have confidence in their ability. Experienced teachers may influence beginning teachers by demonstrating effective teaching practices. Therefore, beginning teachers could model a more experienced teacher’s instruction and assessment practices.

Challenges of the Uses of Formative Assessment

Research suggests that formative assessment can improve student achievement (Li, Marion, Perie, & Gong, 2010). Despite the interest in the use of formative assessment as a method for improving student achievement, the effectiveness of this practice is in question. Dunn and Mulvenon (2009) insisted that the jargon linked to formative assessment and how it is used is unclear. In other words, researchers disagree about the definition of formative and

the proper application of formative assessment. An additional challenge that exists with the application of formative assessment is teachers' misunderstanding of its purpose (Popham, 2008). To add to this dilemma, publishers are marketing materials, which are not formative assessments. Popham (2008) suggested that these well-meaning vendors "mislabel their assessments as formative" (p. 10).

Another problem is that school districts are spending enormous amounts of money on assessments, including commercially developed assessments labeled as formative assessment. According to Goodman and Hambelton (2005), Massachusetts spent 1% of its total school budget on assessment materials. However, districts are misinformed by publishers who state that periodic assessments can determine which students will struggle on the annual standardized assessments (Popham, 2008). According to Popham (2008), "there is currently no research evidence supporting the hypothesis that this kind of periodic assessment is educationally beneficial" (p. 10), which suggests that money spent on this type of assessment is a waste.

In conclusion, the future of formative assessment requires that current formative assessment practices be evaluated to determine a path for future research (Cizek, 2010). Also, inconsistencies in the contextual understanding of purpose and intention of formative assessment as well as teachers' perceptions or beliefs regarding standardized testing may add to the confusion regarding formative assessment. In addition, determining if teachers' perceptions of the dimensions of formative assessment relate to the grade level they teach and their years of experience may provide information for future studies.

This chapter provided a review of research related to the history of formative assessment and the dimensions of formative assessment. In addition, this chapter discussed

the theoretical perspective of this study and the challenges that exist with the application of formative assessment. The following chapter contains information regarding the projected participants, the research design, the instrumentation, the procedures for collecting, and the findings of this study.

Chapter 3

Methodology

This quantitative study sought to determine teachers' responses to the importance and implementation of formative assessment based on grade levels taught and teachers' years of experience. This chapter reviews the research design, the four research questions that guided this study, and a description of the participants of this study. Information about the instrumentation, the procedures used for data collection, and the data analysis are examined.

Research Design

A modified version of Sato et al.'s (2007) survey was used to determine teachers' ratings of 51 survey statements focused on the importance and implementation of formative assessment. Descriptive statistics were employed to investigate the mean, standard deviations, and percentages of teachers' responses to the closed-ended survey statements. The following four research questions guided this study:

Research Questions

1. What are the means, standard deviations, and the percentages of the teachers' responses to the items on the survey concerning the importance of formative assessment based on grade levels taught?
2. What are the means, standard deviations, and the percentages of the teachers' responses to the items on the survey concerning the importance of formative assessment based on years of experience?

3. What are the means, standard deviations, and the percentages of the teachers' responses to the items on the survey concerning the implementation of formative assessment based on grade levels taught?
4. What are the means, standard deviations, and the percentages of the teachers' responses to the items on the survey concerning the implementation of formative assessment based on years of experience?

Participants

The sample population included teachers from one north Mississippi school district. A survey was administered to teachers in the two different elementary schools. The grade levels included prekindergarten, kindergarten, Grade 1, Grade 2, and Grade 3 teachers. Table 1 shows the number of participants based on grade levels taught. Table 2 outlines the number of participants that participated in the study, based on years of experience.

Table 1

Number of Participants Based on Grade Levels Taught

Grade Levels Taught	<i>n</i>
Prekindergarten	10
Kindergarten	15
Grade 1	15
Grade 2	20
Grade 3	17
<i>N</i>	77

Table 2

Number of Participants Based on Years of Experience

Years of Experience	<i>n</i>
0 to 5 years	13
6 to 10 years	31
11 or more years	31
<i>N</i>	77

Instrumentation

This study adapted a survey developed by Sato et al. (2007, 2008). The survey was changed to meet the needs of this study. The primary author, M. Sato, provided permission through personal communication on March 10, 2010, to use any part of Sato et al.'s (2008) survey (see Appendix D). The following two sections discuss the Sato et al. (2008) online survey, followed by a discussion concerning the changes made to the modified version of this survey.

Sato et al.'s Instrument

A modified version of the survey by Sato et al. (2007) was used in this study. The name of their survey was *Examining Changes in Teachers' Classroom Practice* (ECTCP). The ECTCP survey established the six dimensions centered on the importance and implementation of formative assessment. These dimensions were based on various studies (Black & William, 1998; Butler, 1987; Crooks, 1998; Duschl & Gitomer, 1997; National Research Council, 2001; Palincsar & Brown, 1984; Scardamalia, Bereiter, & Steinbach, 1984; Stiggins, 1994; Stiggins & Chappuis, 2006; Wiggins & McTighe, 1998). The studies reviewed provided information related to the characteristics of formative assessment classroom practices and the effective implementation of these practices.

The ECTCP survey contained five parts. Part 1 of the survey focused on teachers' demographic information. Part 2 focused on teachers' perceptions of instruction and assessment practices related to formative assessment. Part 3 identified teachers' methods for communicating with parents and the administration related to assessment practices. Part 4 examined teachers' educational background and certification criteria. Part 5 consisted of determining teachers' previous professional development training related to instruction and assessment.

Revised Instrument

The ECTCP online study was revised to meet the needs of this study. The ECTCP survey used an online format, and the current study was administered using a pencil-and-paper format. The ECTCP survey was renamed the *Teachers' Beliefs of the Importance and Implementation of Formative Assessment* (TBIIFA; see Appendix A). Reformatting the survey to pencil-and-paper was necessary because the school district had a limited number of computers. Parts 1 and 2 of the ECTCP survey remained the same. The items deleted related only to science or math statements, which are not part of this study. In addition, three parts of the ECTCP survey were deleted because these sections focused on the perceptions of parents, administrators, and professional development. These variables are not part of this study. The statement items for each part of the revised survey are an exact duplicate from the ECTCP survey. The following section describes the four parts of the revised survey.

Part 1: Importance of Formative Assessment. Part 1 identified teachers' perceptions of the importance of teaching practices considered as effective instruction by Sato et al. (2007). The teachers rated survey item statements using a 4-point Likert-type scale, which consisted of the following: (1) *not important*, (2) *somewhat important*, (3) *fairly*

important, and (4) *very important*. The revised survey did not modify the survey statements from the ECTCP survey (Sato et al., 2008).

Parts 2 and 3: Implementation of Formative Assessment. These survey statements determined how often teachers implemented specific formative instructional and assessment practices. The statement items were the same as the ECTCP online survey by Sato et al. (2008). Part 2 of the survey contained items 23 to 37, which were on a 5-point rating scale. The rating scale for Part 2 included the following: (1) *never*, (2) *rarely*, (3) *sometimes*, (4) *often*, and (5) *all or almost in all lessons*. The scale for Part 3 was on a 4-point Likert-type scale, which consisted of the following: (1) *never or hardly ever*, (2) *once or twice a month*, (3) *once or twice a week*, and (4) *almost every day*. The differences in the rating scales are due to the fact that Part 2 examined teachers' responses that were focused on the frequency of instructional practices during a school year. In other words, teachers had to consider how often these instructional practices were used over an entire school year. However, Part 3 consisted of survey statements related to the frequency of assessment practices monthly. The reason for changing the time frame is due to the fact that formative assessment is considered an ongoing assessment process, which should occur more frequently than once a year (Sato et al., 2007). This change aligns to research regarding formative assessment, which states formative assessment practices should be used to adjust instruction while teaching (Cizek, 2010; Heritage, 2007; Popham, 2008).

Part 4: Demographic Information. Part 4 of the revised survey consists of two sections. The first section identifies the grade levels of the participants. The second section reports the years of experience of the participants of this study. The last section discusses the procedures utilized during this study, followed by methods used for analyses of data.

Procedures

Approval to complete this study was obtained from the Institutional Review Board (IRB) on November 12, 2010. A copy of the letter from the IRB can be located in Appendix B. Following permission to complete this study, the superintendent of a nearby Mississippi school district was contacted by phone. As a result, a meeting was scheduled for November 15, 2010, to discuss this study and to determine the facility of using this district as part of this study. During the meeting, the superintendent reviewed the survey packets previously sent via mail and agreed that two elementary schools within the district could participate in the study. A meeting was scheduled with principals of the two elementary schools for Monday, November 29, 2010, to discuss this study. The survey packets were mailed to the schools prior to meeting for review. The principals of the schools agreed to allow their teachers to participate.

Each survey packet was coded with a numerical identification number. This number represented the total number of teachers at each school. The grade levels at the lower elementary school included prekindergarten to Grade 1 teachers. The upper elementary school consisted of Grades 2 and 3 teachers. The following summarizes the procedures used for coding, distributing, and gathering data from the participants of this study:

1. The survey packets were coded based on the number of teachers at each school. Thus, the survey packets were assigned a code that ranged from *01* to *86*, which included 45 lower elementary school teachers and 41 upper elementary school teachers.
2. On December 6, 2010, the survey packets were delivered to each principal. The survey packets included the survey (see Appendix A), as well as a letter describing

the study. This letter contained information regarding the study and noted that the study was voluntary. The letter further explained that neither teachers' responses nor the data about the school district would be included in the final report. The purpose for including the cover letter was to protect the confidentiality of the participants and ensure anonymity (see Appendix B).

3. On December 12, 2010, the principals administered the surveys to their teachers during a faculty meeting. The principals distributed the numerically coded survey packets to their teachers.
4. Upon completion of the surveys, the principals placed the completed surveys in a locked filing cabinet.
5. The survey packets remained in the filing cabinet until December 14, 2010. On this date, the completed survey packets were collected and analyses of data began.

Data Analysis

The initial step of data analyses began with sorting and coding the survey packets. The demographic information was coded based on the teachers' grade level and years of experience. The assigned values for the grade levels taught were *0.00*, which signified prekindergarten teachers; *0.01*, kindergarten; *1.00*, Grade 1; *2.00*, Grade 2; and *3.00*, Grade 3. The years of experience were coded, which included teachers with zero to 5 years being assigned the numerical code of *5.0*; *6.0*, 6 to 10 years; and *11.0*, 11 or more years. The participants' identification numbers ranged from *01* to *086*. This information was reviewed and some preliminary notations were made regarding the rate of return of the surveys. It was determined that of the $N = 86$ survey packets administered; $N = 77$ were returned.

Descriptive statistics were used to organize and summarize the findings of the study. The dependent and independent variables were analyzed using the means, standard deviations, and percentages. The importance and implementation of formative assessment were the dependent variables examined in this study. Specific survey items related to the importance of formative assessment included items 1 to 22. The survey items 23 to 51 focused on the implementation of formative assessment. Grade levels taught and numbers of years of experience were the independent variables in this study.

The measures of central tendency consist of determining the mean, median, and mode (Gall, Gall, & Borg, 2007). Gall et al. (2007) recommended that the mean score was the most reliable measure of central tendency compared to the median and mode scores. The mean scores provide information regarding the average score, but they do not describe the amount of variability among the scores. Thus, the standard deviations were calculated to ascertain the degree to which the scores deviated from the mean. The standard deviation can provide information regarding how the scores differ (Patten, 2001). For example, if a rating of 4.0 were consistent for a group of participants, then the standard deviation score would be 0.000. In other words, there was no variability among the participants regarding that survey statement. It can be concluded that the participants felt the same way regarding that specific survey statement. However, if the scores showed variability, then it could be concluded that the participants showed dissimilar beliefs concerning the survey items, which would result in a higher standard deviation. The dependent and independent variables were analyzed using the percentages. The percentages determined which dependent variables showed the highest percentage based on grade levels taught and years of experience.

CHAPTER 4

Results

Chapter 4 discusses the analyses of data to address the four research questions guiding this study. The research questions followed by information on study participants including the survey rate of return, a description of the study participants, and incidence and treatment of missing data are examined. Next, the instrument, TBIIFA, is reviewed (Sato et al., 2008). The survey examined the importance and implementation of formative assessment for teachers in prekindergarten through Grade 3. Teachers' responses to the survey items were analyzed based on grade level taught and number of years of experience. The chapter concludes with a summary analysis of data of the four research questions framing the study.

Research Questions

The research questions guiding the study are as follows:

1. What are the means, standard deviations, and the percentages of the teachers' responses to the items on the survey concerning the importance of formative assessment based on grade levels taught?
2. What are the means, standard deviations, and the percentages of the teachers' responses to the items on the survey concerning the importance of formative assessment based on years of experience?

3. What are the means, standard deviations, and the percentages of the teachers' responses to the items on the survey concerning the implementation of formative assessment based on grade levels taught?
4. What are the means, standard deviations, and the percentages of the teachers' responses to the items on the survey concerning the implementation of formative assessment based on years of experience?

Study Participants

Eighty-six survey packets were sent to teachers in one north Mississippi school district. Seventy-seven teachers completed the survey ($N = 77$), resulting in a response rate of 89.5%. Rudestam and Newton (2007) noted that a 50% to a 60% rate of return is preferred. Thus, the return rate of 89.5% is well above the preferred rate of return. Many surveys have missing data as did this survey of teachers. Missing data was random and was treated as missing data. It is interesting to note that four participants did not complete items 23 and 24 asking about introducing content through formal presentation and using class discussions on the instructional topic. It is unknown why these items were not completed; however, it might have just been an error or the wording of the item might have been confusing.

Study participants consisted of 77 teachers including 57 general education teachers (79.2%), special education teachers ($n = 11$, 15.3%), and four other teachers (gifted, music, art, and physical education; 5.6%). Teachers had between 0 to 11 or more years of experience and grade levels taught were prekindergarten to Grade 3. Overall, teachers were experienced, with 31 teachers having between 6 and 10 years of experience (40.3%) and 11 or more years of experience ($n = 33$, 42.9%; see Table 3).

Table 3

Study Participants by Years of Experience and Grade Levels Taught

	0–5 Years		6–10 Years		11 or More Years	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Prekindergarten	0	0.00	3	30.0	7	70.0
Kindergarten	3	20.0	7	46.7	5	33.3
Grade 1	2	13.3	8	53.3	5	33.3
Grade 2	4	20.0	7	35.0	9*	45.0
Grade 3	4	23.5	6	35.3	7	41.2

Instrument

The ECTCP survey was developed by Sato et al. (2007) and adapted for this study. The ECTCP survey was renamed the *Teachers' Beliefs of the Importance and Implementation of Formative Assessment* (TBIIFA) and can be found in Appendix A. The first subscale of the TBIIFA consisted of 22 items and addressed importance of formative assessment utilizing a 4-point Likert-type response scale of *not important* (1), *somewhat important* (2), *fairly important* (3), and *very important* (4). The *importance* subscale had a calculated Cronbach's alpha of $\alpha = .846$, indicating a high level of internal consistency and reliability. The second subscale consisted of 15 items and addressed instruction. The *implementation* of formative assessment subscale had a calculated Cronbach's alpha of $\alpha = .954$ and used a 5-point Likert-type response scale of *never* (1), *rarely* (2), *sometimes* (3), *often* (4), and *all or almost all lessons* (5). The third subscale contained 14 items and addressed *usage* of formative assessment. The assessment subscale used a 4-point Likert-type response scale of *never* (1),

once or twice a month (2), *once or twice a week* (3), and *every day* (4). The calculated Cronbach's alpha for the assessment subscale was $\alpha = .899$. The calculated Cronbach's alpha for the total TBIIFA scale was $\alpha = .968$. Reliability analysis indicated the TBIIFA scale and the three subscales had very high levels of internal consistency and reliability.

Data Analyses

The study addressed four research questions to determine teachers' perceptions of importance and implementation (dependent variables) using grade level and years of experience as the independent variables. The means, standard deviations, and frequencies were calculated for the dependent variables using the Statistical Package of Social Sciences (SPSS Version 17.0) to answer the four research questions that formed the basis of this study. The items in the importance and implementation subscales of the TBIIFA were rank ordered using the means to determine what teachers thought about the importance or implementation of each item. Each grade level is presented separately followed by a discussion of how the grade levels were similar or different. Years of experience is presented separately followed by a summary of how years of experience affected the responses of teachers.

Results for Research Question 1 (RQ1)

The purpose of the first research question was to determine the means, standard deviations, and percentages of teachers' responses by grade level taught of the items on the *importance* subscale. Each grade level is presented separately. Table 4 contains the overall means, standard deviations, and percentages for RQ1 and rank-ordered items and percentages on the importance of formative assessment for all grade levels taught can be found in Appendix E.

The first research question posed by the study was as follows:

RQ1: What are the means, standard deviations, and the percentages of the teachers' responses to the items on the survey concerning the importance of formative assessment based on grade levels taught?

Prekindergarten

Prekindergarten teachers ranked establishing discipline and management ($M = 3.90$, $SD = 0.31$), recognizing and responding to diverse learning needs ($M = 3.90$, $SD = 0.31$), and practicing routine skills ($M = 3.90$, $SD = 0.31$) as their highest level of importance.

Interestingly, this was followed in importance by applying skills and knowledge in different contexts ($M=3.90$, $SD=0.42$) and using a variety of assessment techniques ($M = 3.80$, $SD = .042$). The majority of the prekindergarten teachers (80%–90%) responded that they thought these items were *Very Important*. Of lesser importance were fostering competition to encourage quality work ($M = 2.10$, $SD = 0.73$), grouping students in ability groups ($M = 2.20$, $SD = 0.91$), and relying on tests and assessment for evaluation of students ($M = 2.50$, $SD = 0.84$). Prekindergarten teachers also did not find having students work in cooperative groups ($M = 2.90$, $SD = 1.10$) or having opportunities for peer assessment ($M = 2.60$, $SD = 0.96$) important. Overall, prekindergarten teachers indicated that 17 of the 22 items were *Fairly Important* or *Very Important*.

Kindergarten

One hundred percent of the kindergarten teachers ranked establishing discipline and management, having students participate in hands-on activities, and adjusting instruction based on the reaction and responses of the class or individual as their highest level of importance ($M = 4.00$, $SD = 0.00$). This was followed in importance by providing concrete

experiences before abstract concepts and recognizing (93.3% *Very Important*) and responding to the diverse learning needs of students ($M = 3.93$, $SD = 0.25$). The percentage of kindergarten teachers that felt these items were *Very Important* was (73.3%).

Items reported as less important were fostering competition to encourage quality work (18 of the 22 items were *Fairly Important* or *Very Important*; $M = 2.26$, $SD = 1.03$), providing opportunities for peer assessment ($M = 2.46$, $SD = 0.99$), and grouping students in classes according to their abilities ($M = 2.66$, $SD = 0.99$). Kindergarten teachers also did not indicate relying on tests and written assessment for student evaluation ($M = 2.86$, $SD = 0.74$) or requiring the prompt completion of work ($M = 3.13$, $SD = 0.63$) as important. In general, kindergarten teachers rated 18 out of the 22 dependent variables above the midpoint range.

Grade 1

Grade 1 teachers ranked establishing discipline and management and recognizing and responding to diverse learning needs ($M = 3.93$, $SD = 0.25$) as *Very Important* (93.3%) instructional practices. The next items ranked as *Very Important* were the use of a variety of assessment techniques and strategies ($M = 3.85$, $SD = 0.36$) and communicating learning goals to students ($M = 3.80$, $SD = 0.41$). This was followed in importance by the practice of routine skills ($M = 3.73$, $SD = 0.59$). The majority of the Grade 1 teachers (93.3% and 80%) felt these items were *Very Important*.

Of lesser importance were fostering competition to encourage quality work ($M = 2.33$, $SD = 1.34$), relying on tests and written assessment for student evaluation ($M = 2.66$, $SD = .61$), and providing opportunities for peer assessment ($M = 2.73$, $SD = 0.79$). Other items considered less important were grouping students according to their ability ($M = 2.80$, $SD = 0.94$) and preparing and implementing detailed lesson plans ($M = 2.93$, $SD = 0.79$). Overall,

Grade 1 teachers specified 18 of the 22 items as *Fairly Important* or *Very Important*.

Grade 2

Grade 2 teachers ranked establishing discipline and management ($M = 3.95, SD = 0.22$) as the most important item. Interestingly, this was followed in importance by having students participate in hands-on activities and practice routine skills ($M = 3.80, SD = 0.41$). The next subscale items rated as important were considering students' prior understanding when planning curriculum and instruction, engaging students in the applications of skills, and having knowledge in a variety of contexts ($M = 3.75, SD = 0.44$). Grade 2 teachers (95% and 75%) reported these items as *Very Important* instructional practices for effective instruction.

Fostering competition to encourage quality work ($M = 2.10, SD = 0.96$), grouping students in ability groups ($M = 2.60, SD = 0.88$), and providing opportunities for peer assessment ($M = 2.76, SD = 0.96$) were not considered as important. Grade 2 teachers also did not find relying on tests and written assessment for student evaluation ($M = 2.90, SD = 0.78$) or requiring the prompt completion of work ($M = 3.05, SD = 0.68$) as important. Overall, Grade 2 teachers indicated 19 of the 22 items were *Fairly Important* or *Very Important*.

Grade 3

Grade 3 teachers ranked establishing discipline and management ($M = 4.00, SD = 0.00$), helping students take responsibility for their own learning ($M = 3.94, SD = 0.00$), and recognizing and responding to the diverse learning needs of students ($M = 3.67, SD = 0.34$) as their highest level of importance. Interestingly, this was followed in importance by engaging students in the applications of skills and knowledge in a variety of contexts and adjusting instruction based on the reaction and responses of the class or individuals ($M = 3.82, SD =$

0.39). The majority of the Grade 3 teachers (82.4%–100%) reported these items as *Very Important*.

Items of lesser importance were fostering competition to encourage quality work ($M = 2.37$, $SD = 1.14$), grouping students in ability groups ($M = 2.58$, $SD = 1.12$), and relying on tests and assessment for evaluation of students' learning ($M = 2.82$, $SD = 0.72$). Grade 3 teachers also reported providing some opportunities for peer assessment ($M = 2.88$, $SD = 0.69$) and requiring the prompt completion of work ($M = 2.94$, $SD = 0.74$) as less important methods for effective instruction. Primarily, Grade 3 teachers noted that 16 of the 22 items were *Fairly Important* or *Very Important*.

Results for Research Question 2 (RQ2)

The purpose of the second research question was to determine the means, standard deviations, and percentages of teachers' responses by years of experience of the items on the *Importance* subscale. The three intervals for the numbers of years of experience are presented separately. A complete table of the rank-ordered items and percentages on the importance of the three intervals for years of experience can be found in Appendix F.

The second research question posed by the study was as follows:

RQ2: What are the means, standard deviations, and the percentages of the teachers' responses to the items on the survey concerning the importance of formative assessment based on years of experience?

0–5 Years of Experience

Teachers with 0–5 years of experience ranked establishing discipline and management ($M = 4.00$, $SD = 0.00$) as the highest level of importance and having students participate in hands-on activities ($M = 3.92$, $SD = 0.27$) as important. Interestingly, this was followed in

importance by recognizing and responding to the diverse learning needs of students ($M = 3.84$, $SD = 0.37$). Three other items reported as *Very Important* instructional practices were considering students' prior understanding when planning curriculum and instruction, helping students take responsibility for their own learning, and adjusting instruction based on the reaction and responses of the class or individual ($M = 3.76$, $SD = 0.43$). The majority of teachers with 0–5 years of experience (76.9%–100%) felt these items were *Very Important*.

Fostering competition to encourage quality work ($M = 2.38$, $SD = 0.96$), providing peer opportunities for peer assessment ($M = 2.46$, $SD = 0.87$), and grouping students in classes according to their abilities ($M = 2.46$, $SD = 1.12$) were ranked the lowest for this group. Teachers with 0–5 years of experience also did not feel relying on tests and written assessment for student evaluation important ($M = 2.69$, $SD = 0.63$), and preparing and implementing detailed lesson plans ($M = 3.30$, $SD = 0.86$) was, on average, *Somewhat Important*. Generally, teachers with 0–5 years of experience indicated that 18 of the 22 items were *Fairly Important* or *Very Important*.

6–10 Years of Experience

Teachers with 6–10 years of experience ranked establishing discipline and management ($M = 3.93$, $SD = 0.24$), recognizing and responding to the diverse learning needs of students ($M = 3.86$, $SD = 0.34$), and helping students take responsibility for their own learning ($M = 3.80$, $SD = 0.40$) as important practices. Engaging students in applications of skills and knowledge in a variety of contexts ($M = 3.74$, $SD = 0.44$) and using classroom or informal questioning to assess student understanding were important ($M = 3.74$, $SD = 0.51$). The teachers with 6–10 years of experience (74.2%–93.5%) reported these items as *Very Important* practices.

Survey statements considered least important were fostering competition to encourage quality work ($M = 2.29$, $SD = 1.21$), grouping students in classes according to their abilities ($M = 2.46$, $SD = 0.85$), and relying on tests and written assessment for student evaluation ($M = 2.70$, $SD = 0.64$). Teachers with 0–5 years of experience also indicated providing opportunities for peer assessment ($M = 2.74$, $SD = 0.99$) and requiring the prompt completion of work ($M = 3.06$, $SD = 0.77$) as less important instructional practices. Primarily, the teachers with 6–10 years of experience reported that 18 of the 22 items were *Fairly Important* or *Very Important*.

11 or More Years of Experience

Teachers with 11 or more years of experience ranked establishing discipline and management ($M = 3.96$, $SD = 0.17$), recognizing and responding to the diverse learning needs of students ($M = 3.84$, $SD = 0.44$), and practicing routine skills ($M = 3.81$, $SD = 0.46$) as the most important instructional practices. Followed in importance were providing concrete experiences before abstract concepts ($M = 3.78$, $SD = 0.48$) and engaging students in applications of skills and knowledge in a variety of contexts ($M = 3.78$, $SD = 0.41$). The majority of teachers with 11 or more years of experience (78.8%–97%) felt these instructional practices were *Very Important* for demonstrating effective instruction.

The least important were fostering competition to encourage quality work ($M = 2.12$, $SD = 0.94$), providing opportunities for peer assessment ($M = 2.75$, $SD = 0.75$), and grouping students in classes according to their abilities ($M = 2.75$, $SD = 0.93$). Items also considered of less importance were requiring the prompt completion of work ($M = 2.87$, $SD = 0.85$) and having students work in cooperative learning groups or teams ($M = 2.96$, $SD = 0.64$). Eighteen of the 22 items were rated as *Fairly Important* or *Very Important* by the teachers

with 11 or more years of experience. Tables 4 and 5 are the highest and lowest ranked means based on teachers with 11 or more years of experience.

Results for Research Question 3 (RQ3)

The purpose of the third research question was to determine the means, standard deviations, and percentages of teachers' responses by grade levels taught for the items on the *Implementation* subscales. There were two sections on the Implementation of formative assessment. The first Implementation section included the instructional practices utilized yearly and included items 23 to 37. These items were on a 5-point Likert-type rating scale as follows: *never* (1), *rarely* (2), *sometimes* (3), *often* (4), and *all or almost in all lessons* (5). The second Implementation section involved identifying teachers' *Assessment Practices*, which included items 38–51. The Assessment section utilized a 4-point Likert-type response scale of *never* (1), *once or twice a month* (2), *once or twice a week* (3), and *almost every day* (4). Each grade level is presented separately for the instructional practices section and for the Assessment section, since each section uses a different rating scale. A complete table of the rank-ordered items and percentages for the implementation (Instruction and Assessment) for all grade levels taught can be found in Appendix G.

The third research question posed by the study was as follows:

RQ3: What are the means, standard deviations, and the percentages of the teachers' responses to the items on the survey concerning the implementation of formative assessment based on grade levels taught?

The next subscale items used most often were allowing students to work at their own pace ($M = 3.90$, $SD = 1.26$) and facilitating student project work ($M = 3.90$, $SD = 1.44$). Between 40% and 50% of the prekindergarten teachers implemented these instructional practices in all or almost all lessons. The remaining percentages ranged between never to once or twice a week.

The instructional practices implemented rarely (a few times a year) included showing a videotape or TV program ($M = 2.11$, $SD = 0.78$) and asking students to write reflections in notebooks or journals ($M = 2.70$, $SD = 1.82$). The instructional practices implemented less frequently included assigning homework ($M = 3.00$, $SD = 1.63$), introducing content through formal presentations ($M = 3.00$, $SD = 1.33$), and using assessments to find out what students know before a unit ($M = 3.40$, $SD = 1.26$).

Kindergarten

Kindergarten teachers ranked the instructional practices of requiring students to explain their reasoning when giving an answer ($M = 4.66$, $SD = 0.46$), allowing students to work at their own pace ($M = 4.53$, $SD = 0.74$), and using computers ($M = 4.46$, $SD = 0.51$) as instructional practices used in all or almost all lessons. The next subscale items implemented most frequently were the use of open-ended questions during class discussions ($M = 4.40$, $SD = 1.12$) and demonstrating problems or procedures ($M = 4.40$, $SD = 0.82$). Kindergarten teachers (80%) reported using these instructional approaches often or in all or almost all lessons. Four out of these five highest ranked subscale items were implemented between sometimes (a few times a year) to all or almost all of their lessons.

More than half of the kindergarten teachers made use of videotape or TV programs ($M = 3.06$, $SD = 0.70$), and 40% facilitated student projects ($M = 3.66$, $SD = 0.97$) often or once

or twice a week. One-third of this group implemented the instructional practice of holding class discussions on the topic of instruction in all or almost all lessons ($M = 3.85$, $SD = 0.66$). Introducing content through formal presentations was employed often or once or twice a week by 66.7% of these teachers ($M = 3.73$, $SD = 0.70$). Slightly more than half (53.7%) carried out the practice of using assessments to find out what students know before a unit ($M = 3.86$, $SD = 1.12$). Eighty to 100% of the kindergarten teachers employed 10 out of the 15 subscale practices once or twice a week or in all or almost all their lessons.

Grade 1

One hundred percent of the Grade 1 teachers reported using computers ($M = 4.78$, $SD = 0.42$), assigning homework ($M = 4.73$, $SD = 0.59$), or holding class discussions on the topic of instruction ($M = 4.53$, $SD = 0.51$) as their highest ranked instructional practices. Teachers required students to explain their reasoning when giving an answer ($M = 4.46$, $SD = 0.51$) often or once or twice a week or in all or almost all of their lessons. Teachers reported that using open-ended questions during class discussions ($M = 4.40$, $SD = 0.63$) and demonstrating a problem or procedure ($M = 4.40$, $SD = 0.50$) were highly rated instructional procedures. First-grade teachers made use of videotapes or TV programs ($M = 3.33$, $SD = 0.81$), and 60% facilitated student projects ($M = 3.53$, $SD = 0.74$) often or once or twice a week. First-grade teachers embedded assessment in regular class activities ($M = 3.66$, $SD = 1.04$) or used assessments to find out what students did and did not know before and during a unit ($M = 3.73$, $SD = 0.79$). It is interesting that the first-grade teachers, on average, rated all of the items in the instructional practices section as sometimes, often, or almost all.

Slightly more than half of the Grade 1 teachers integrated the approach of showing a videotape or TV program ($M = 3.33$, $SD = 0.81$), and 26.7% sometimes facilitated student

projects ($M = 3.53$, $SD = 0.74$). Another method of instruction, embedding assessment in regular class activities ($M = 3.66$, $SD = 1.04$), using assessment to find out what students knew before or during a unit ($M = 3.73$, $SD = 0.79$), and introducing content through formal presentations were incorporated less often. The majority or 93.3% of these teachers employed these instructional practices either sometimes or often.

Grade 2

Eighty percent of the Grade 2 teachers required students to explain their reasoning when giving an answer ($M = 4.35$, $SD = 0.93$) and 85% used open-ended questions during class discussions ($M = 3.33$, $SD = 0.81$) sometimes or often. Demonstrating a problem ($M = 4.25$, $SD = 0.96$), using computers ($M = 4.10$, $SD = 1.16$), and allowing students to work at their own pace ($M = 4.10$, $SD = 0.78$) were approaches that were applied either sometimes or often. Eighty-five to 100% of the Grade 2 teachers made use of these methods of instruction either rarely, sometimes, or often.

Showing a videotape or TV program ($M = 2.65$, $SD = 0.96$), facilitating student project work ($M = 3.30$, $SD = 1.17$), and allowing students to present their work to the class ($M = 3.60$, $SD = 0.59$) were ranked three of the lowest subscale items. Asking students to write reflections in notebooks or journals ($M = 3.80$, $SD = 1.27$) and using assessment to find out what students know before or during a unit were integrated by the majority of these teachers rarely, sometimes, or often. Overall, the Grade 2 teachers rated all these subscale items between 3.00–5.00, with the exception of showing videotapes or TV programs. This subscale item was below 3.00, which resulted in 50% of these teachers rarely using this method of instruction.

Grade 3

One hundred percent of the Grade 3 teachers used computers ($M = 4.81$, $SD = 0.40$) as an instructional practice often or almost all the time. Using open-ended questions during class discussions ($M = 4.76$, $SD = 0.43$), requiring students to explain their reasoning when giving an answer ($M = 4.76$, $SD = 0.56$), and holding class discussions on the topic of instruction ($M = 4.58$, $SD = 0.50$) were employed by 95% of these teachers often or almost all the time. This was followed by demonstrating a problem or procedure ($M = 4.52$, $SD = 0.71$),

The subscale items utilized less often included showing a videotape or TV program ($M = 2.88$, $SD = 0.85$), asking students to write reflections in notebooks or journals ($M = 3.41$, $SD = 1.06$), and facilitating student project work ($M = 3.47$, $SD = 1.00$). Following these subscale items and incorporated less frequently were allowing students to present their work to the class ($M = 3.58$, $SD = 0.71$) and using assessment to find out what students know before or during a unit ($M = 3.70$, $SD = 0.91$). The Grade 3 teachers ranked 14 out of the 15 of these subscale items as either implemented rarely, often, or almost all the time. Less than 95% of these teachers never employed these instructional practices.

Assessment Section

Prekindergarten

Ninety percent of the prekindergarten teachers reported using students' contributions in class discussions as an assessment practice and this was incorporated every day ($M = 3.70$, $SD = 0.94$). Interestingly, this was followed by 70% of the teachers assessing students through hands-on activities daily ($M = 3.60$, $SD = 0.69$). Sixty percent utilized oral questioning of individual students ($M = 3.20$, $SD = 1.13$), anecdotal records ($M = 3.00$, $SD = 1.15$), and portfolios for student work ($M = 2.90$, $SD = 1.44$) as methods of assessment.

Thirty percent of these teachers never assessed student learning through portfolios and 50% implemented anecdotal records as an assessment approach. Fifty percent to 90% of the prekindergarten teachers implemented these assessment practices monthly, weekly, or daily.

Assessment practices included less frequently were short and long written responses ($M = 1.30$, $SD = 0.67$) and multiple-choice tests ($M = 1.40$, $SD = 0.84$). Eighty percent of the prekindergarten teachers reported never integrating these assessment practices. Sixty percent of the teachers noted never in utilizing peer assessment ($M = 2.00$, $SD = 1.24$) and written reflections in learning journals as part of their assessment procedures ($M = 2.10$, $SD = 1.44$). Five out of the 14 assessment items were included monthly, weekly, or every day by 70%–100% of the prekindergarten teachers.

Kindergarten

Eighty percent of the kindergarten teachers rated hands-on activities as an assessment approach used every day ($M = 3.80$, $SD = 0.41$). The next approach implemented by 86.7% of the kindergarten every day was student notebooks or journals ($M = 3.73$, $SD = 0.79$). This practice was followed by students' contributions in class discussions ($M = 3.66$, $SD = 0.61$), oral questioning of individual students ($M = 3.60$, $SD = 0.63$), and written reflections in learning journals ($M = 3.26$, $SD = 1.22$). The majority (80%–90%) of these teachers assessed student learning through one of these five approaches.

Subscale assessments integrated less often were multiple-choice tests ($M = 1.66$, $SD = 0.89$), with 60% of these teachers never including this assessment method. Forty percent of the kindergarten teachers utilized peer assessments monthly and 40% never included this practice ($M = 1.86$, $SD = 0.91$). Slightly more than half of these teachers never used short and long written responses for evaluating student learning ($M = 1.86$, $SD = 1.12$). This was

followed by group project or presentations ($M = 2.06$, $SD = 0.70$) and self-assessments ($M = 2.14$, $SD = 0.86$). Overall, 70%–90% of the kindergarten teachers assessed students using 10 out of the 14 assessment practices monthly, weekly, or daily.

Grade 1

The Grade 1 teachers assessed student learning through homework with 73.3% of these teachers implementing this assessment practice every day ($M = 3.60$, $SD = 0.82$). Sixty percent integrated oral questioning of individual students every day ($M = 3.53$, $SD = 0.63$) and 66.7% used students' contributions in class discussions every day. One-third assessed students' understanding through hands-on activities ($M = 3.40$, $SD = 0.98$) and 40% incorporated student notebooks or journals ($M = 3.13$, $SD = 0.91$). Most of the Grade 1 teachers (93.3%–100%) evaluated students utilizing the five assessment approaches mentioned earlier.

Peer assessment was never used by 46.7% of the Grade 1 teachers ($M = 1.73$, $SD = 0.79$). This was followed by self-assessment ($M = 1.93$, $SD = 0.79$), with 33.3% of these teachers never including this assessment method. Slightly more than half of the Grade 1 teachers never assessed students through portfolios ($M = 1.93$, $SD = 1.12$), and 80% utilized group projects or presentations ($M = 1.93$, $SD = 0.45$). This was followed by individual projects or presentations ($M = 2.06$, $SD = 0.25$), with 93.3% of the Grade 1 teachers incorporating this practice monthly. Overall, 70%–90% of the Grade 1 teachers assessed students using 13 out of the 14 assessment practices monthly, weekly, or daily.

Grade 2

Sixty percent of the Grade 2 teachers reported using oral questioning of individual students every day ($M = 3.45$, $SD = 0.75$), and students' contributions in class discussions (M

= 3.40, $SD = 0.82$) and homework were assessment practices used every day ($M = 3.25$, $SD = 1.11$). Twenty percent of these teachers indicated that hands-on activities were used daily ($M = 2.90$, $SD = 0.71$). This was followed in the frequency of use of anecdotal records for everyday performance ($M = 2.60$, $SD = 1.09$). Interestingly, the findings for the subscale item, using anecdotal evidence to pinpoint students' current performance, varied.

The subscale assessment items used less frequently by Grade 2 teachers were individual projects or presentations ($M = 1.80$, $SD = 0.83$), group projects or presentations ($M = 1.85$, $SD = 0.74$), and peer assessments ($M = 1.89$, $SD = 0.73$). Ten percent of these teachers indicated using portfolios as an assessment approach daily and 35% never implemented this type of evaluation ($M = 2.15$, $SD = 1.03$). Forty-five percent of the Grade 1 teachers noted using multiple-choice tests weekly ($M = 2.20$, $SD = 1.00$). Generally, 70%–100% of the Grade 2 teachers assessed students using 7 out of the 14 assessment practices monthly, weekly, or daily.

Grade 3

Sixty percent of the Grade 3 teachers reported using students' contributions in class discussion ($M = 3.64$, $SD = 0.70$) as a type of assessment approach every day. Homework was the next highest rated assessment method with 60% of these teachers and the second ranked ($M = 3.47$, $SD = 0.94$). The third highest ranked subscale item was oral questioning of individual students ($M = 3.41$, $SD = 0.71$). This was followed by hands-on activities ($M = 3.23$, $SD = 0.75$) and multiple-choice testing ($M = 3.05$, $SD = 0.62$).

Grade 3 teachers reported using individual projects or presentations ($M = 1.76$, $SD = 0.83$), portfolios ($M = 1.85$, $SD = 0.74$) and group projects ($M = 1.82$, $SD = 0.95$) less frequently. Sixty percent to 80% of these teachers indicated that these assessment methods

were either never used or were implemented monthly. The subscale item peer assessment was noted by 47.4% of the Grade 3 teachers as a practice utilized monthly. This was followed by written reflection in learning journals ($M = 2.35$, $SD = 1.09$). All in all, the 70%–100% of the Grade 3 teachers assessed students using 6 out of the 14 assessment practices monthly, weekly, or daily.

Results for Research Question 4 (RQ4)

The purpose of the fourth research question was to determine the means, standard deviations, and percentages of teachers' responses by years of experience of the items on the *implementation* subscale. The three intervals for the numbers of years of experiences are presented separately. Two different sections are included related to the implementation of formative assessment. The first implementation section consisted of Instructional Practice using items 23 to 37. These items were on a 5-point rating scale and items 38–51 were on a 4-point Likert-type response scale. The second section was Assessment and included items 38–51. Each section is presented separately. A complete table of the rank-ordered items and percentages for the implementation (Instruction and Assessment) for all years of experience taught can be found in Appendix G.

The fourth research question posed by the study was as follows:

RQ4: What are the means, standard deviations, and the percentages of the teachers' responses to the items on the survey concerning the implementation of formative assessment based on years of experience?

Instructional Practice

0–5 Years of Experience

Teachers with 0–5 years of experience indicated the subscale assessment items used every day were demonstrating a problem or procedure ($M = 4.76$, $SD = 0.43$) and computers ($M = 4.76$, $SD = 0.48$). Interestingly, this was followed by assigning homework as an assessment practice and was utilized daily by teachers with 0–5 years of experience ($M = 4.61$, $SD = 0.67$). Requiring students to explain their reasoning when giving an answer ($M = 4.53$, $SD = 0.87$), using open-ended questions during class ($M = 4.38$, $SD = 0.65$), and allowing students to work at their own pace ($M = 4.38$, $SD = 0.65$) were the top-ranked items. The teachers with 0–5 years of experience (80%–90%) reported using these assessment practices often or in almost all their lessons.

The *Instructional Practices* employed less often included showing a videotape or TV program ($M = 2.69$, $SD = 0.85$), facilitating student projects ($M = 2.92$, $SD = 0.95$), and asking students to write reflections in notebooks or journals ($M = 3.38$, $SD = 1.50$); these were not consistently integrated as part of these teachers' assessment methods. Mainly, the average mean score of 3.00 was showed for 13 out of the 15 subscale items.

6–10 Years of Experience

Teachers with 6–10 years of experience identified using computers ($M = 4.50$, $SD = 0.82$) as an instructional approach either often or almost in all lessons (93.3%). Interestingly, this was followed by using open-ended questions during class discussions ($M = 4.48$, $SD = 0.62$), requiring students to explain their reasoning when giving an answer ($M = 4.48$, $SD = 0.62$), and allowing students to work at their own pace ($M = 4.32$, $SD = 0.97$). This was followed by assigning homework ($M = 4.32$, $SD = 0.97$). More than half of these teachers

indicated using these assessment practices almost all of the time in their lessons.

One subscale item was noted as being utilized by 53.3% of the teachers sometimes, which was showing a videotape or TV program ($M = 2.96$, $SD = 0.86$). The next lowest ranked item was facilitating student project work ($M = 3.56$, $SD = 0.96$), with 48.4% using this instructional method sometimes. Surprisingly, using assessment to find out what students know before or during a unit was also one of the lowest ranked items ($M = 3.64$, $SD = 0.95$). However 48.4% of these teachers reported using this assessment method often or twice a month. Two other subscale items, using anecdotes or personal stories to convey information ($M = 4.00$, $SD = 1.03$) and embedding assessment in regular class activities ($M = 4.00$, $SD = 0.77$) were rated as two of the lowest ranked items. Generally, 14 out of the 15 subscale items were incorporated into instruction either sometimes, often, or in all or almost all lessons.

11 or More Years of Experience

Teachers with 11 or more years of experience had the highest ranked items, including demonstrating a problem or procedure ($M = 4.39$, $SD = 1.02$), requiring students to explain their reasoning ($M = 4.30$, $SD = 1.01$), and using open-ended questions during class discussions ($M = 4.27$, $SD = 1.06$). This was followed by the use of computers ($M = 4.21$, $SD = 1.15$) and holding class discussions on the topic of instruction ($M = 4.13$, $SD = 0.93$). Approximately 90%–100% of these teachers reported using these practices sometimes, often, or in almost all their lessons.

The subscale assessment items showing the lowest percentages and scores consisted of using a videotape or TV program ($M = 2.61$, $SD = 0.95$) and asking students to write reflections in notebooks or journals ($M = 3.42$, $SD = 1.41$). Interestingly, using assessment to find out what students know before or during a unit ($M = 3.63$, $SD = 0.92$), allowing students

to present their work to the class ($M = 3.66$, $SD = 1.02$), and embedding assessments in regular class activities ($M = 3.66$, $SD = 1.08$) were rated lower by these teachers. On average, 14 out of the 15 assessment practices were incorporated sometimes, often, or in all or almost all lessons. However, all 15 items rated by teachers with 11 or more years of experience yielded the lowest ratings across all the years of experience intervals.

Assessment

0-5 Years of Experience

The implementation of homework was identified as the being used by 54.8% of these teachers every day ($M = 3.69$, $SD = 0.65$). The assessment practice of oral questioning of individual students ($M = 3.69$, $SD = 0.63$), students' contributions in class discussion ($M = 3.53$, $SD = 0.77$), and hands-on activities ($M = 3.30$, $SD = 0.76$) were consistently employed by teachers with 0–5 years of experience. Ninety percent to 100% of these teachers used these assessment approaches weekly or every day.

Teachers with 0–5 years of experience integrated individual projects or presentations ($M = 1.53$, $SD = 0.66$), group projects or presentations ($M = 1.69$, $SD = 0.75$), and peer assessments ($M = 1.84$, $SD = 0.68$) either never or monthly. Self-assessment ($M = 2.00$, $SD = 0.81$) and peer assessment ($M = 2.08$, $SD = 1.06$) were used less often by teachers with 0–5 years of experience. Eleven out of the 14 items were implemented by teachers with 0–5 years of experience either weekly or every day.

6–10 Years of Experience

The findings for assessment section items found that teachers with 6–10 years of experience used students' contributions in class discussions ($M = 3.61$, $SD = 0.66$), hands-on activities ($M = 3.68$, $SD = 0.66$), and homework ($M = 3.38$, $SD = 0.80$) as the methods of

assessment. Oral questioning of individual students ($M = 3.38$, $SD = 0.71$) and student notebooks or journals ($M = 3.06$, $SD = 0.96$) were included as part of their assessment practices frequently. Of these methods, 30.8% of the teachers with 6–10 years of experience never incorporated student notebooks or journals at least monthly.

Peer assessment ($M = 2.13$, $SD = 0.93$), individual projects or presentations ($M = 2.16$, $SD = 1.10$), and portfolios and group projects or presentations ($M = 2.19$, $SD = 0.70$) were rated as the lowest items. Another approach used less frequently was short and long written assignments. Slightly more than half never integrated individual projects or presentations. Fourteen of the subscale items were part of these teachers' assessment practices monthly, weekly, or every day.

11 or More Years of Experience

Teachers (72.7%) included students' contributions in class discussions ($M = 3.48$, $SD = 0.93$) as an assessment along with oral questioning of individual students ($M = 3.42$, $SD = 0.83$) and hands-on activities ($M = 3.24$, $SD = 0.75$) every day. The use of student notebooks ($M = 2.75$, $SD = 1.37$) and homework ($M = 2.72$, $SD = 1.35$) were mainly integrated monthly, weekly, or every day. However, one-third of these teachers never utilized student notebooks or homework.

The lowest ranked items consisted of using peer assessment ($M = 1.78$, $SD = 0.92$), group projects or presentations ($M = 1.81$, $SD = 0.76$), and individual projects or presentations ($M = 1.96$, $SD = 0.98$). Slightly less than 80% of the teachers never incorporated these assessment practices or employed them monthly. Peer assessment yielded 48.5% of these teachers to indicate that they never employed this assessment practice. The use of short and long written responses ($M = 2.09$, $SD = 1.01$) and portfolio collections of student work ($M =$

2.24, $SD = 1.19$) were also used infrequently by teachers with 11 or more years of experience. Notably, only 3 out of the 14 items had a mean score above 3.00. In addition, all 14 items rated by teachers with 11 or more years of experience yielded the lowest ratings across all the years of experience intervals.

Summary

In conclusion, RQ1 showed similarities among grade levels taught (independent variable) for the importance subscale items (dependent variable). The average mean score of 3.00 and higher was reported for 17 out of the 22 dependent variables for the prekindergarten, Grade 1, and Grade 3 teachers. Eighteen out of the 22 dependent variables indicated an average mean score of 3.00 for the kindergarten and Grade 2 teachers.

RQ2 yielded comparable results for the following dependent variables: establishing discipline and management procedures and recognizing and responding to the diverse learning needs. Both of these dependent variables were ranked as the most important for all years of experience intervals (independent variable). However, the dependent variable, adjusting instruction based on the reaction and responses of the class or individual, showed dissimilar findings. One hundred percent of the teachers with 1–5 years of experience felt this variable was either fairly important or very important. As the number of years of experience increased, the importance of these instructional practices increased.

Providing concrete experiences before abstract concepts showed the opposite results based on the number of years of experience. Teachers with less experience (53.5%) designated this dependent variable as very important compared to teachers with 6–10 years of experience (71%). The percentage of teachers with 11 or more years of experience indicated providing

concrete experiences before abstract concepts (81.8%) as one of the highest ranked variables among the 22 dependent variables.

RQ3 showed similarities and dissimilarities between the dependent variables (implementation) and independent variable (grade levels taught). The dependent variable, assigning homework, and one of the implementation subscale items that indicated teachers in the lower grades used this instructional practice less often than teachers in the higher grades. However, the frequency of embedding assessment in regular class activities varied by grade levels taught. Fifty percent of the prekindergarten and 66.7% of the kindergarten and Grade 1 teachers implemented this instructional practice often. However, 40% of the Grade 2 teachers and 76.5% of the Grade 3 teachers used this practice often. The assessment subscale item findings had disparities between the dependent variables and the independent variables. RQ4 showed similarities and dissimilarities between the dependent variables (complementation) and independent variable (grade levels taught). The dependent variable, homework, was implemented less often by prekindergarten and kindergarten teachers compared to Grades 1, 2, and 3. Portfolios were integrated more often by the prekindergarten teachers with 60% evaluating learners with the assessment method. More than one-third of the Grades 2 and 3 and 53.3% of the Grade 1 teachers never measured students' acquisition of skills and knowledge with the use of portfolios. Thus, teachers' felt formative assessment was important but did not consistently implement this practice. The next chapter presents discussions and conclusions of the findings of this study as well as implications for future research, followed by a summary of the study.

CHAPTER 5

Discussions and Recommendations

The study sought to determine teachers' responses to the instructional and assessment practices focused on formative assessment. This quantitative research employed descriptive statistics to determine teachers' responses from one north Mississippi school district to a 51-item survey. This survey investigated teachers' beliefs of the importance and implementation of formative assessment based on grade levels taught and years of experience. The dependent variables were 51 subscale items focused on the importance and implementation of formative assessment. The independent variables included grade levels taught and years of experience.

This chapter restates the purpose and the research questions that formed the basis of this study. Results is analyzed and reported as well as compared to previous research to determine support of existing literature or deviation from previous studies. Next, these research questions are discussed and compared to previous studies to determine support of existing literature or variations. This is followed by summary and possible recommendations for future research.

Purpose of the Study

The purpose of this quantitative study was to investigate teachers' beliefs in the importance and implementation (dependent variables) of formative assessment in one north Mississippi school district. In addition, this study determined whether teachers' grade levels taught and the years of experience (independent variables) were different based on the importance and implementation of formative assessment.

Research Questions

The research questions guiding the study are as follows:

1. What are the means, standard deviations, and the percentages of the teachers' responses to the items on the survey concerning the importance of formative assessment based on grade levels taught?
2. What are the means, standard deviations, and the percentages of the teachers' responses to the items on the survey concerning the importance of formative assessment based on years of experience?
3. What are the means, standard deviations, and the percentages of the teachers' responses to the items on the survey concerning the implementation of formative assessment based on grade levels taught?
4. What are the means, standard deviations, and the percentages of the teachers' responses to the items on the survey concerning the implementation of formative assessment based on years of experience?

Discussion of Research Question 1

RQ1 examined the importance of formative assessment. The dependent variables explored in this study consisted of the *Importance* subscale items 1–22 of the 51-item survey.

The independent variables examined in this study were the different grade levels taught.

The findings showed dissimilar results between the dependent variables and the independent variables. Collectively, the overall mean, standard deviations, and percentages indicated prekindergarten, Grade 1, Grade 2, and Grade 3 teachers strongly agreed that establishing discipline and classroom management was a very important instructional practice for demonstrating effective instruction. These findings confirmed Bandura's (1995) research

regarding the influence of vicarious experiences and social persuasion related to grade levels taught. In addition, the results agreed with Tschannen-Moran and Woolfolk Hoy's (2007) study. Their study associated the social-cognitive theory to teachers' beliefs in relationship to grade levels taught. This study proposed that teachers' perceptions can be changed related to the influences of their colleagues. In other words, teachers' grade level does affect their beliefs because other teachers at the same grade level can alter a teacher's instructional practices positively or negatively.

Another dependent variable with similar results was the importance of responding to the diverse learning needs of students. Teachers in four out of the five grade levels felt this practice was very important. Even though Grade 2 teachers did not rank this subscale item as one of the highest, 95% of these teachers reported this subscale item as either very important or fairly important. Overall, all grade levels indicated recognizing and responding to the diverse learning needs of students as significant to demonstrate effective instruction. These findings add to previous research regarding teachers' beliefs concerning changing instruction to meet the needs of the learner by McNair et al. (2003). McNair and her colleagues' study argued the significance of identifying the learning needs of students for demonstrating effective instruction.

Two dependent variables, practicing routine skills and engaging students in applications of skills and knowledge in a variety of contexts were indicated by three out of the five grade levels taught (dependent variable). Prekindergarten, Grade 1, and Grade 2 teachers ranked practicing routine skills as one of their highest. However, kindergarten and Grade 3 teachers ranked this statement in the bottom half of all 22 items. Thus, these teachers may feel other instructional practices are more important to effective instruction compared to

practicing routine skills. The importance of engaging students in applications of skills and knowledge in a variety of contexts was rated by prekindergarten, Grade 2, and Grade 3 teachers as an important dependent variable. Even though kindergarten and Grade 1 teachers did not rate this dependent variable as one of the highest, it was ranked in the top half.

The dependent variable, using a variety of assessment techniques and strategies, was shown by two out of the five grade levels taught as very important. The prekindergarten and Grade 1 teachers felt that varied assessments were important instructional practices. The use of multiple assessments has been a pivotal component of formative assessment (Bloom et al., 1971). This idea was discussed as part of the theory of mastery learning (Bloom et al., 1971).

The purpose of varied assessments is to identify students' level of understanding prior to teaching (Bloom et al., 1971). Despite the importance of prior knowledge suggested by Bloom, the results of the current study showed dissimilar results among grade levels taught for the dependent variable, considering students' prior understanding when planning curriculum and instruction. Prekindergarten teachers reported that students' prior knowledge was less important than the other grade levels. However, none of the grade levels felt this variable was as important as discipline and management. Along with varied assessments is the significance of changing instruction based on the information collected regarding students' prior knowledge.

The dependent variable, adjusting instruction based on the reaction and responses of the class or individual, had differences among grade levels taught. One hundred percent of the kindergarten teachers ($M = 4.00$, $SD = 0.00$) were in agreement regarding the significance of this approach to teaching and learning. The majority of the Grade 3 teachers (82.4%) concurred with the kindergarten teachers. The percentages were dissimilar across grade

levels, with only slightly more than half or 55.5% of the Grade 2 teachers and 60.0% of the prekindergarten teachers. The number of Grade 1 teachers that believed this practice was important increased slightly to 66.7%. The disparity in results across grade levels taught suggests these teachers have dissimilar beliefs across grade levels regarding the significance of this method of teaching. These findings are particularly noteworthy because the importance of adjusting instruction on the reaction and responses of the class or individual is paramount to the proper implementation of formative assessment. The lack of consistency among grade levels taught contradicts research associated with the components of formative assessment. Popham (2008) argued that formative assessment must include adjustments to instruction to be considered as formative assessment. Other research supports this belief (Bloom et al., 1971; Heritage, 2007; Sato et.al., 2008; Zimmerman & Dibeneddetto, 2008). Bloom and his colleagues' (1971) mastery learning theory suggests that modifications during instruction through the use of corrective feedback is vital for mastery of the targeted objectives.

The findings showed differences among grade levels regarding the value of concrete experiences before abstract concepts. More than half or 60.0% of the prekindergarten and Grade 2 teachers considered this classroom approach as very important. In contrast, 93.3% of the kindergarten and Grade 1 teachers felt this practice was significant for demonstrating effective instruction, and the percentage for Grade 3 teachers was 76.5%. It can be concluded that these Grade 3 teachers believed that concrete experience before abstract concepts were more important than prekindergarten and Grade 2 teachers. It appears that teachers within the same grade level had similar responses to the merit of providing concrete experience before abstract concepts. This paralleled previous research by Fives and Buehl (2010) and

Tschannen-Moran and Woolfolk-Hoy (2001), which stated teachers' beliefs of instruction is influenced by grade levels taught.

Another variation in teachers' responses occurred with the importance of having students participate in hands-on activities. Variability among teachers' ratings of this survey statement determined that all the kindergarten teachers believed using hands-on activities was a very important practice. However, 80.0% of the Grade 2 teachers agreed with this belief. The lowest percentage was indicated by the prekindergarten teachers, with only 60.0% of these teachers feeling the importance of this practice. Thus, only the kindergarten teachers consistently valued the importance of hands-on activities. This lack of commonality among teachers' responses to this variable contradicts previous research by McNair et al. (2003), which revealed that teachers in earlier grades utilized more concrete and hands-on activities compared to teachers in upper grades.

The variable for determining the importance of fostering competition for quality work yielded the lowest mean scores, and low standard deviations and percentages across grade levels taught. Possible reasons for these low scores could be attributed to the wording of the survey statement. Because of the term *competition*, the participants may have interpreted the meaning in its most literal sense. In other words, the participants may have felt that they were encouraging competition among their students.

The importance of providing opportunities for peer assessment also ranked as one of the lowest scores across grade levels taught. The mean score for this item ranged from 2.88 indicated by the Grade 3 teachers to 2.47 for the kindergarten teachers. The other grade levels fell within these mean scores. The significance of providing opportunities for peer assessment is another approach for evaluating student learning (Heritage, 2007; Sato et al.,

2008). Popham (2008) recommended using peer assessments as a method for promoting opportunities for students to take ownership in their learning. He further proposed that this approach could make learning more meaningful for the student.

Discussion of Research Question 2

RQ2 determined teachers' responses to the importance of formative assessment based on years of experience. The results for RQ2 showed some similarities as well as dissimilarities. One example occurred with the significance of establishing discipline and classroom management. One hundred percent of the teachers with zero to five years of experience felt this was a significant factor for effective instruction. The mean score for teachers with zero to five years was 4.00 ($SD = 0.000$), which indicated no variability in teachers' perception of this survey statement. Similar results were noted for teachers with 6–10 years of experience, with 93.5% of them rating this variable as important. The percentage went up for teachers with 11 or more years of experience, with 97.0% of them rating this as important. These results indicated that inexperienced or experienced teachers felt that establishing discipline and classroom management was very important. These findings contradict prior research by Fives and Buehl (2010), which suggested that teachers with less experience felt that classroom management is much more important than teachers with more experience.

Teachers with 0–5 years of experience rated the use of hands-on activities as the second highest in importance, with 92.3% rating this instructional approach as very important. The remaining 7.7% of these teachers believed hands-on activities were fairly important for demonstrating effective instruction. However, 71% of the teachers with 6–10 years of experience deemed this practice as very important. Twenty-nine percent felt this approach

was fairly important. Teachers with 11 or more years of experience rated this method as somewhat important (6.10%), fairly important (18.2%), and very important (75.8%). These findings indicated that teachers with less experience believed hands-on activities were more important than teachers with more experience. It is not apparent in current research concerning teachers' beliefs of hands-on activities and its importance related to years of experience. However, the use of this pedagogical strategy promotes opportunities for students to deepen their understanding of the concepts (Darling-Hammond, 2000).

The variable of the importance of considering students' prior understanding when planning curriculum and instruction yielded dissimilar results. Teachers with 0–5 years of experience identified this item slightly more important than the other two groups based on years of experience. The percentages ranged from 84.6% for 0–5 years to 61.3% for the teachers with 6–10 years of experience. The percentage of teachers with 11 or more years that reported considering students' prior understanding as important when planning curriculum and instruction was 78.8%. This variable is vital for formulating and structuring instruction based on the learners' needs (Popham, 2008). These results revealed that novice teachers felt that identifying students' prior knowledge was a significant factor in demonstrating effective instruction. However, teachers with more experience believed this practice was less important.

The significance of identifying students' prior knowledge was suggested by Bloom et al. (1971) through the mastery learning theory. This theory recommends uncovering students' present level of understanding to promote mastery of the objectives. Therefore, the participants of the current study disagree regarding the importance of this practice, which could result in a student's acquisition of the goals.

Another variable explored the significance of providing opportunities for peer assessment. Twenty-nine percent of the teachers with 6–10 years of experience indicated that peer assessment was very important, 21.4% for teachers with 0–5, and 15.2% for those with 11 or more years of experience. A study by Jacobs (2003) suggested that the use of peer assessment promotes metacognition. Woolfolk (2011) indicated that metacognition required students to reason and problem solve, which is vital for deepening students’ knowledge and skills.

The importance of preparing and implementing detailed lesson plans is discussed next. Teachers with 6–10 and 11 or more years of experience had a mean score of 3.28 for this survey item. Teachers in these groups felt that preparing and implementing detailed lesson plans was not a significant factor for demonstrating effective instruction, with 6.3% of the teachers with 6–10 year of experience and 2.6% for those with 11 or more years of experience reporting. These results disagree with research concerning the importance of detailed lesson plans by Herman and Choi (2008). Their study stated that accurate lesson plans provided the supported instruction, which included the identification of students’ misunderstandings of the content.

Discussion of Research Question 3

RQ3 addressed the implementation of formative assessment instructional practices based on grade levels taught. These variables were on a 5-point rating scale, which included the following: (1) *never*, (2) *rarely or a few times a year*, (3) *sometimes*, (4) *often or once or twice a week*, and (5) *all or almost in all lessons*. The results for these variables were inconsistent across grade levels taught. The kindergarten and Grade 1 teachers ranked all 15 of the *Implementation Instruction* subscale sections above average. In other words, these

teachers consistently had similar responses regarding the frequency of their implementation of instructional practices. These findings are consistent with research by Bandura (1995), which suggested that vicarious experiences can influence an individual's beliefs.

The dependent variable, assigning homework, one of the *Implementation Instruction* items, indicated that teachers in the lower grade used this instructional practice less often than teachers in the higher grades. The frequency of using this instructional practice as an assessment practice showed that the Grades 1, 2, and 3 teachers implemented homework as an instructional and assessment practice more often than prekindergarten and kindergarten teachers.

The findings for the dependent variable, embedding assessment in regular class activities based on grade levels taught (independent variable), do not support previous research regarding teachers' implementation of formative assessment practices. These findings suggest that even though 30.0% of the prekindergarten teachers utilized this practice in all or almost all their lessons, a larger percentage of the Grade 3 teachers consistently implemented this practice. The results contradict a study by McNair et al. (2003), which reported that prekindergarten teachers implemented formative assessment 95% of the time compared to 88% for Grades 3 and 4.

Another dependent variable that was not in agreement with prior research was explaining their reasoning when giving an answer. Forty percent of the prekindergarten teachers used this instructional practice often and 40% either never, rarely, or sometimes utilized this approach. Comparing these findings to the Grade 3 teachers indicated that 82.4% of the Grade 3 teachers utilize this method of instruction more often than the prekindergarten teachers. These findings conflict with research by Yap and her contemporaries (2008), which

suggested that upper grade level teachers frequently measure lower levels of cognitive thinking and do not assess higher order thinking skills.

The assessment practice consistently used every day by all grade levels was oral questioning of individual students. This assessment practice was ranked as one of the highest by all grade levels. Oral questioning was identified as one of Sato et al.'s (2008) dimensions of formative assessment. Their research, along with Hargreaves (2005), recommended the use of oral questioning for monitoring student learning. Therefore, the current study supports previous research regarding the importance of oral questioning.

The dependent implementation variable, portfolio collection of student work, was noted by the prekindergarten teachers as an assessment approach used by 60% of these teachers every day. However, 53.3% of the kindergarten teachers used this method for evaluating student learning only monthly. The same percentage for Grade 1 teachers shows that they never utilize this assessment approach. Thirty-five percent of the Grades 2 and 3 teachers never assess student learning through portfolios. The purpose of using portfolios as part of the process of formative assessment is to determine students' understanding of the content (Heritage, 2007, Popham, 2008, Stiggins, 2008). Even though the results of the current study do not describe how teachers use portfolios, the results do suggest that only prekindergarten teachers consistently implement this assessment method. A study by McNair et al. (2003) investigated teachers' beliefs of the importance and implementation of formative assessment and results showed that teachers in prekindergarten to Grade 4 utilize portfolios as summative assessment rather than formative. In other words, teachers use the information from the portfolios for grades and not for changing instruction based on the results.

Another assessment variable that showed inconsistencies among grade levels was the frequency of the use of multiple-choice tests. Forty-five percent of the Grade 3 teachers reported evaluating student learning through the use of weekly multiple-choice tests. These teachers rated this variable as one of the five highest ranked variables. A larger number, 86.7% of the Grade 1 teachers, used weekly multiple-choice tests. Even though 45% of the Grade 2 teachers implemented this method weekly, the mean score was below the midpoint ($M = 2.20$, $SD = 1.00$), which suggests variability among the teachers' responses. Eighty percent of the prekindergarten and 60% of the kindergarten teachers never use multiple-choice testing to assess student learning. These findings are in agreement with McNair et al. (2003). This study found that teachers in upper grades are more likely to use pencil-and-paper assessments rather than other methods of evaluation. In addition, the current study confirmed research by Yap and her contemporaries (2008), which suggested that upper grade level teachers frequently measure lower levels of cognitive thinking. In other words, multiple-choice testing less frequently encourages students to use higher order thinking skills.

Peer assessments were consistently never used across grade levels taught. These variables, along with self-assessments, were ranked below the midpoint by all grade levels. The dependent variable, peer assessment, was used less often than self-assessments. Eighty percent of the prekindergarten teachers reported never evaluating students through peer assessments. The frequency of the use of this practice increased by grade levels taught with Grades 2 and 3 teachers implementing this approach at least monthly. The results for the variable, self-assessment, were not incorporated regularly by any grade level. However, research suggests that the use of these practices (Andrade & Cizek, 2010; Bloom et al., 1971;

Cizek, 2010; Moss & Brookhart, 2009; Sato et al., 2008; William et al., 2004) can promote self-regulated learners.

Discussion of Research Question 4

RQ3 and RQ4 investigated the means, standard deviations, and percentages of the teachers' responses to the items on the survey related to the implementation of formative assessment. The implementation of instruction and assessment practices were the dependent variables, and the independent variable was years of experience. The results for RQ4 showed irregularity across years of experience. In other words, very few variables were consistent across years of experience.

The dependent variable, the use of computers, was used by 93.3% of the teachers with 6–10 years of experience often or in almost all lessons. Similar findings were found for teachers with 0–5 years of experience. However, 81.3% of the teachers with 11 or more years of experience used this instructional practice often or in almost all lessons. Research indicates that teachers' use of varies instructional and assessment practices can reach the needs of all learners (Ruiz-Primo & Furtak, 2006; Sato et al., 2008; Stiggins & DuFour, 2009). Thus, teachers with less experience used this practice more often than teachers with more experience. The survey showed a trend of the more experienced teachers using computers less than the inexperienced teachers. This could be related to novice teachers having more experience with computers than teachers with more experience.

The instructional practice of using questioning was one of the highest ranked items for all the years of experience. These results confirm previous research which indicates that teachers' instructional practice of questioning allows teachers opportunities to uncover

students' misconceptions related to the content (Heritage, 2007; Popham, 2008; Sato et al., 2008).

Research for the dependent variable, multiple-choice tests, showed that the number of years of experience did not alter teachers' frequency of using multiple-choice tests as an assessment approach. Slightly more than 45% of these teachers evaluated students through weekly multiple-choice testing. These findings agreed with research by McNair et al. (2003), which reported that the number of years of experience does not significantly change teachers' use of pencil-and-paper tests.

Teachers with 0–5 years of experience reported implementing the practice of embedding assessment in regular class activities as an instructional approach used by 76.9% of these teachers often. The number of teachers with 6–10 and 11 or more years of experience implemented this instruction less often than teachers with 0–5 years of experience. Integrating assessments within instruction is a critical element of formative assessment (Bloom et al., 1971; Heritage, 2007; Popham, 2008; Ruiz-Primo & Furtak, 2006; Sato et al., 2008).

The frequency of the implementation of the instructional practice of a videotape or TV program resulted in similar results based on grade levels taught. A teachers' years of experience did not change teachers' use of this instructional practice. One possible explanation for the low mean scores and low number of teachers that use this method may be that teachers do not consider videotapes or TV as an appropriate approach for teaching concepts. In addition, the wording of the survey item may need to be revised to include updated terms such as multimedia presentations. According to Pastore (2010), multimedia instruction allows instructors to focus on auditory and visual learning modes.

Another interesting aspect is that teachers with 0–5 of experience used the practice of requiring students to explain their reasoning more often than teachers with more experience. Research recommends that through the process of formative assessment, teachers need to integrate opportunities for students to justify their own answers (Andrade & Cizek, 2010; Brookhart, Moss, & Long, 2008). Allowing students to think about their own learning promotes learning with understanding. Therefore, the current study found that teachers with less experience were more likely to incorporate the practice of requiring students to explain their reasoning more frequently than teachers with more experience.

Teachers with 0–5 years of experience reported assigning homework as an instructional practice more often than teachers with more experience. As the number of years of experience increased, the percentage of teachers that used this assessment practice decreased. These findings may suggest that teachers with less experience include assessments throughout instruction compared to teachers with more experience.

Teachers' implementation of the dependent variable, peer assessment, by years of experience, resulted in similar findings. This variable was shown consistently as one of the lowest ranked instructional practices. The use of peer assessments as a method for evaluating student learning is considered as practice that promotes self-directed learning (Cizek, 2010; Moss & Brookhart, 2009; Sato et al., 2007, 2008; Stiggins, 2007).

There was no difference among years of experience and the dependent variable, self-assessment. This variable was ranked as one of the assessment practices used less often by all teachers in this study. Self-assessment is another variable recommended by researchers as part of the process of formative assessment.

The variables related to group projects and individual presentations were the two lowest mean scores for all years of experience intervals. The implementation of group and individual projects and presentations are additional assessment methods, which can promote varied assessments (Cizek, 2010, Heritage, 2007). Therefore, the teachers of the current study do not frequently assess student learning through group and individual projects.

Summary

The purpose of this quantitative study was to determine whether differences existed between years of experience and grade levels taught based on the teachers' responses to the subscale items related to the importance and implementation of formative assessment. There were similarities and differences between the *Importance Subscale Items* (dependent variables) and grade levels taught (independent variables). The *Implementation Subscale Items*, which included instructional and assessment practices, resulted in the assessment practices being used less often than the instructional practices. Thus, this study showed higher means, lower standard deviations, and higher percentages regarding the importance of formative assessment. However, the implementation of formative assessment resulted in inconsistent practice of this approach, which supports research by Many and Jakicic (2006).

Recommendations

The following recommendations are made based on the findings of this research.

1. It is recommended that the survey items be revised and piloted to include open-ended questions. The wording of the survey items were unclear and may have resulted in a lack of response or inaccurate results.
2. It is recommended that additional research be conducted regarding the importance and implementation of formative assessment. Additional research is necessary

regarding teachers' understanding of instruction and assessment. In addition, follow-up questioning should be conducted that probes teachers' understanding of the components of formative assessment and the impact standardized testing has on teachers' instructional and assessment practices.

3. Further study could include focus groups, individual teacher interviews, and documentation from teachers of different formative assessment practices implemented into the classroom.
4. Ongoing staff development training which includes classroom observations is needed to gain a deeper understanding of teachers' implementation of formative techniques.
5. Specific methods of observation should be developed to ensure consistency among the observers. In addition, carefully designed documentation forms need to be created and piloted to determine the changes necessary for clarity.
6. Another component needed is the use of specific and consistent feedback to the teachers as well as methods for teachers to self-assess their own progress.

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Appendix A

	Teacher Survey Part 1 Views of Assessment In your view, how important is each of the following teaching practices for effective instruction in your classroom (select one response for each statement month)	Not important (1)	Somewhat important (2)	Fairly important (3)	Very important (4)
1	Provide concrete experiences before abstract concepts.				
2	Establish discipline and management procedures.				
3	Consider students' prior understanding when planning curriculum and instruction.				
4	Communicate learning goals to the students.				
5	Require the prompt completion of work.				
6	Have students work in cooperative learning groups or teams.				
7	Have students participate in hands-on activities.				
8	Rely on tests and written assessments for student evaluation.				
9	Provide students with opportunities to reflect on their own learning and understanding.				
10	Engage students in applications of skills and knowledge in a variety of contexts.				
11	Recognize and respond to the diverse learning needs of students.				
12	Use classroom or informal questioning to assess student understanding.				
13	Make connections between subject area and other disciplines.				
14	Foster competition to encourage quality work.				
15	Help students take responsibility for their own learning.				
16	Group students in classes according to their abilities.				
17	Prepare and implement detailed lesson plans.				
18	Engage students in conversations of what constitutes quality work.				
19	Practice routine skills.				
20	Provide opportunities for peer assessment.				
21	Use a variety of assessment techniques and strategies.				
22	Adjust instruction based on the reaction and responses of the class or individual				

<p style="text-align: center;"><u>Teacher Survey Part 2</u></p> <p>About how often do you do each of the following in your instruction in this class (select one response for each statement)?</p>	Never (1)	Rarely (e.g., a few times a year) (2)	Sometimes (e.g., once or twice a month) (3)	Often (e.g., once or twice a week) (4)	All or in almost all lessons (5)
Introduce content through formal presentations.					
Hold class discussions on topic of instruction.					
Use computers.					
Use open-ended questions during class discussions.					
Allow students to work at their own pace.					
Facilitate student project work.					
Show a videotape or TV program.					
Assign homework.					
Ask students to write reflections in notebooks or journals.					
Embed assessment in regular class activities.					
Demonstrate a problem or procedure.					
Require students to explain their reasoning when giving an answer.					
Use anecdotes or personal stories to convey information.					
Use assessment to find out what students know before or during a unit.					
Allow students to present their work to the class.					

<u>Teacher Survey Part 3</u>		Never or hardly ever (1)	Once or twice a month (2)	Once or twice a week (3)	Almost every day (4)
	How often do you use the following to assess your students (select one response for each statement)?				
38	Multiple-choice tests				
39	Short and long written responses				
40	Individual projects or presentations				
41	Group projects or presentations				
42	Hands-on activities				
43	Homework				
44	Portfolio collections of student work				
45	Student notebooks or journals				
46	Anecdotal records or everyday performance				
47	Oral questioning of individual students				
48	Written reflections in (learning) journals				
49	Peer assessment				
50	Self-assessment				
51	Students' contributions in class discussions				

Teacher Survey Part 4

Section A: What grade level(s) do you teach? (Mark all that apply.)

- Kindergarten 5th grade 9th grade Other (Special Education)
 1st grade 6th grade 10th grade
 2nd grade 7th grade 11th grade
 3rd grade 8th grade 12th grade
 4th grade

Section B: Counting this year, how many years have you been teaching?

- 1–5 years 11–15 years
 3–5 years 16–20 years
 6–10 years More than 20 years

Appendix B

Dear Teacher:

I am a student at the University of Mississippi pursuing my doctoral degree in elementary education. As part of my program of study, I am required to complete research related to my professional goals and leading to a dissertation. My interest is in the area of the importance and implementation of formative assessment compared to teachers' grade levels and years of experience.

The purpose of this study is to determine whether there is a difference between teachers' personal beliefs concerning the importance and practice of formative assessment and the influence of these practices compared to grade levels taught and their years of experience. In addition, this study will determine whether differences exist between teachers' beliefs of the importance and implementation of formative assessment compared to teachers' grade levels taught and years of experience.

To participate in this study you are being asked to complete the attached survey, which examines your perceptions of formative assessment practices. Completion of the survey should not take more than 20 minutes. I will not be in the room while you complete the survey. Your participation in this study is voluntary. If you start completing the survey and decide that you do not want to finish, you may place the incomplete survey into the envelope attached to this cover letter.

Your survey will be assigned a number code, which may be located at the upper right-hand corner of the survey. The data will be analyzed and reported as aggregated group data. All information will be kept in a locked cabinet and the only individuals with access to this information are the researcher (Diane Lowry), and my dissertation advisor, Dr. Sidney Rowland. Neither your responses nor the data about your school will be identified in any of the reports.

If you have any questions about this study, please contact me by phone (662) 915-5753 or email dlowry@olemiss.edu. My dissertation advisor is Dr. Sidney Rowland and she can be contacted by phone (662) 915-7738 or by email at srowland@olemiss.edu.

This study has been reviewed by The University of Mississippi's Institutional Review Board (IRB). The IRB has determined that this study fulfills the human research subject protection

obligations required by state and federal law and University policies. If you have any questions, concerns, or reports regarding your rights as a participant of research, please contact the IRB at (662) 915-7482. Thank you for taking time out of your busy schedule to take part in this study.

Sincerely,

Diane Lowry

The University of Mississippi

Office Number: (662) 915-5753

dlowry@olemiss.edu

Appendix C



The
University of Mississippi
Oxford • Jackson • Tupelo • Southaven

Office of Research and
Sponsored Programs
100 Barr Hall
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November 15, 2010

Ms. Diane Lowry
3726 Lyles Drive
Oxford, MS 38655

Dr. Sidney Rowland
Curriculum and Instruction
University, MS 38677

Dear Ms. Lowry and Dr. Rowland:

This is to inform you that your application to conduct research with human participants, ***A Survey of Teachers' Beliefs Regarding the Importance and Implementation of Formative Assessment (Protocol 11-085)***, has been approved as Exempt under 45 CFR 46.101(b)(2).

Please remember that all of The University of Mississippi's human participant research activities, regardless of whether the research is subject to federal regulations, must be guided by the ethical principles in *The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research*.

It is especially important for you to keep these points in mind:

- You must protect the rights and welfare of human research participants.
- Any changes to your approved protocol must be reviewed and approved before initiating those changes.
- You must report promptly to the IRB any injuries or other unanticipated problems involving risks to participants or others.

If you have any questions, please feel free to call me at (662) 915-7482.

Sincerely,


Diane W. Lindley
Coordinator, Institutional Review Board

A Great American Public University
www.olemiss.edu

Appendix D

Subject: RE: Formative Assessment Survey

From: Misty Sato <msato@umn.edu>

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1 attachment: NB Research Study Final Report for distribution 3-30-07.doc 2 MB

Diane –

The technical report is attached. It has the instruments in the appendix. Please cite appropriately and keep me posted about your results !! I would love to learn about what you are doing.

Misty

Appendix E

Tables for Research Question 1

Prekindergarten Importance Subscale - Means , Standard Deviations, and Percentages

		<i>Mean</i>	<i>SD</i>	Not Important	Somewhat Important	Fairly Important	Very Important
2	Establish discipline and management procedures.	3.90	0.31	0.00	0.00	10.0	90.0
11	Recognize and respond to the diverse learning needs of students.	3.90	0.31	0.00	0.00	10.0	90.0
19	Practice routine skills.	3.90	0.31	0.00	0.00	10.0	90.0
10	Engage students in applications of skills and knowledge in a variety of contexts.	3.80	0.42	0.00	0.00	20.0	80.0
21	Use a variety of assessment techniques and strategies.	3.80	0.42	0.00	0.00	20.0	80.0
4	Communicate learning goals to the students.	3.70	0.67	0.00	10.0	10.0	80.0
1	Provide concrete experiences before abstract concepts.	3.60	0.51	0.00	0.00	40.0	60.0
7	Have students participate in hands-on activities.	3.60	0.69	0.00	10.0	20.0	70.0
15	Help students take responsibility for their own learning.	3.60	0.51	0.00	0.00	40.0	60.0
22	Adjust instruction based on the reaction and responses of the class or individual.	3.60	0.51	0.00	0.00	40.0	60.0
12	Use classroom or informal questioning to assess student understanding.	3.50	0.70	0.00	10.0	30.0	60.0
9	Provide students with opportunities to reflect on their own learning and understanding.	3.40	0.84	0.00	20.00	20.0	60.0
17	Prepare and implement detailed lesson plans.	3.40	0.96	10.0	0.00	30.0	60.0
18	Engage students in conversations of what constitutes quality work.	3.40	0.69	0.00	10.0	40.0	50.0
3	Consider students' prior understanding into account when planning curriculum and instruction.	3.30	0.67	0.00	10.0	50.0	40.0
13	Make connections between subject area and other disciplines.	3.20	0.63	0.00	10.0	60.0	30.0
5	Require the prompt completion of work.	3.00	0.81	0.00	30.0	40.0	30.0
6	Have students work in cooperative learning groups or teams.	2.90	1.10	10.0	30.0	20.0	40.0
20	Provide opportunities for peer assessment	2.60	0.96	10.0	40.0	30.0	20.0
8	Rely on tests and written assessments for student evaluation.	2.50	0.84	10.0	40.0	40.0	10.0
16	Group students in classes according to their abilities.	2.20	0.91	20.0	50.0	20.0	10.0
14	Foster competition to encourage quality work.	2.10	0.73	20.0	50.0	30.0	0.0

Kindergarten Importance Subscale—Means, Standard Deviations, and Percentages

		<i>Mean</i>	<i>SD</i>	Not Important	Somewhat Important	Fairly Important	Very Important
2	Establish discipline and management procedures.	4.00	0.00	0.00	0.00	0.00	100
7	Have students participate in hands-on activities.	4.00	0.00	0.00	0.00	0.00	100
22	Adjust instruction based on the reaction and responses of the class or individual.	4.00	0.00	0.00	0.00	0.00	100
1	Provide concrete experiences before abstract concepts.	3.93	0.25	0.00	0.00	6.7	93.3
11	Recognize and respond to the diverse learning needs of students.	3.93	0.25	0.00	0.00	26.7	73.3
3	Consider students' prior understanding when planning curriculum and instruction.	3.86	0.36	0.00	0.00	13.3	86.7
10	Engage students in applications of skills and knowledge in a variety of contexts.	3.73	0.45	0.00	0.00	26.7	73.3
12	Use classroom or informal questioning to assess student understanding.	3.73	0.45	0.00	0.00	26.7	73.3
13	Make connections between subject area and other disciplines.	3.66	0.61	0.00	6.70	20.0	73.3
15	Help students take responsibility for their own learning.	3.66	0.48	0.00	0.00	33.3	66.7
19	Practice routine skills.	3.66	0.61	0.00	6.70	20.0	73.3
21	Use a variety of assessment techniques and strategies.	3.66	0.61	0.00	6.70	20.0	73.3
9	Provide students with opportunities to reflect on their own learning and understanding.	3.60	0.63	0.00	6.70	26.7	66.7
18	Engage students in conversations of what constitutes quality work.	3.53	0.63	0.00	6.70	33.3	60.0
4	Communicate learning goals to the students.	3.46	0.83	0.00	20.0	13.3	66.7
17	Prepare and implement detailed lesson plans.	3.46	0.63	0.00	6.70	40.0	53.3
6	Have students work in cooperative learning groups or teams.	3.26	0.79	0.00	20.0	33.3	46.7
5	Require the prompt completion of work.	3.13	0.63	0.00	13.3	60.0	26.7
8	Rely on tests and written assessments for student evaluation.	2.86	0.74	0.00	33.3	46.7	20.0
16	Group students in classes according to their abilities.	2.66	0.61	6.70	33.3	46.7	13.3
20	Provide opportunities for peer assessment.	2.46	0.99	20.0	26.7	40.0	13.3
14	Foster competition to encourage quality work.	2.26	1.03	26.7	33.3	26.7	13.3

Grade 1 Importance Subscale—Means, Standard Deviations, and Percentages

		<i>Mean</i>	<i>SD</i>	Not Important	Somewhat Important	Fairly Important	Very Important
2	Establish discipline and management procedures.	3.93	0.25	0.00	0.00	6.70	93.3
11	Recognize and respond to the diverse learning needs of students.	3.93	0.25	0.00	0.00	6.70	93.3
21	Use a variety of assessment techniques and strategies.	3.85	0.36	0.00	0.00	14.3	85.7
4	Communicate learning goals to the students.	3.80	0.41	0.00	20.0	80.0	100
19	Practice routine skills.	3.73	0.59	0.00	6.70	13.3	80.0
1	Provide concrete experiences before abstract concepts.	3.66	0.61	0.00	6.70	20.0	73.3
3	Consider students' prior understanding when planning curriculum and instruction.	3.66	0.61	0.00	6.70	20.0	73.3
7	Have students participate in hands-on activities.	3.66	0.48	0.00	0.00	33.3	66.7
10	Engage students in applications of skills and knowledge in a variety of contexts.	3.66	0.48	0.00	0.00	33.3	66.7
15	Help students take responsibility for their own learning.	3.66	0.61	0.00	6.70	20.0	73.3
12	Use classroom or informal questioning to assess student understanding.	3.60	0.63	0.00	6.70	26.7	66.7
22	Adjust instruction based on the reaction and responses of the class or individual.	3.60	0.63	0.00	6.70	26.7	66.7
18	Engage students in conversations of what constitutes quality work.	3.46	0.74	0.00	13.3	26.7	60.0
13	Make connections between subject area and other disciplines.	3.40	0.63	0.00	6.70	46.7	46.7
9	Provide students with opportunities to reflect on their own learning and understanding.	3.26	0.70	0.00	13.3	46.7	40.0
5	Require the prompt completion of work.	3.20	0.77	0.00	20.0	40.0	40.0
6	Have students work in cooperative learning groups or teams.	3.13	0.91	6.70	13.3	40.0	40.0
17	Prepare and implement detailed lesson plans.	2.93	0.79	6.70	13.3	60.0	20.0
16	Group students in classes according to their abilities.	2.80	0.94	6.70	33.3	33.3	26.7
20	Provide opportunities for peer assessment.	2.73	0.79	0.00	46.7	33.3	20.0
8	Rely on tests and written assessments for student evaluation.	2.66	0.61	0.00	40.0	53.3	6.7
14	Foster competition to encourage quality work.	2.33	1.34	40.0	20.0	6.7	33.3

Grade 2 Importance Subscale—Means, Standard Deviations, and Percentages

		<i>Mean</i>	<i>SD</i>	Not Important	Somewhat Important	Fairly Important	Very Important
2	Establish discipline and management procedures.	3.95	0.22	0.00	0.00	5.0	95.0
7	Have students participate in hands-on activities.	3.80	0.41	0.00	0.00	20.0	80.0
19	Practice routine skills.	3.80	0.41	0.00	0.00	20.0	80.0
3	Consider students' prior understanding when planning curriculum and instruction.	3.75	0.44	0.00	0.00	25.0	75.0
10	Engage students in applications of skills and knowledge in a variety of contexts.	3.75	0.44	0.00	0.00	25.0	75.0
12	Use classroom or informal questioning to assess student understanding.	3.75	0.44	0.00	0.00	25.0	75.0
18	Engage students in conversations of what constitutes quality work.	3.75	0.44	0.00	0.00	25.0	75.0
4	Communicate learning goals to the students.	3.70	0.73	5.00	0.00	15.0	80.0
9	Provide students with opportunities to reflect on their own learning and understanding.	3.70	0.47	0.00	0.00	30.0	70.0
11	Recognize and respond to the diverse learning needs of students.	3.70	0.57	0.00	5.00	20.0	75.0
13	Make connections between subject area and other disciplines.	3.70	0.47	0.00	0.00	30.0	70.0
1	Provide concrete experiences before abstract concepts.	3.55	0.60	0.00	5.00	35.0	60.0
15	Help students take responsibility for their own learning.	3.55	0.60	0.00	5.00	35.0	60.0
21	Use a variety of assessment techniques and strategies.	3.55	0.60	0.00	5.00	35.0	60.0
22	Adjust instruction based on the reaction and responses of the class or individual.	3.50	0.60	0.00	5.00	40.0	55.0
6	Have students work in cooperative learning groups or teams.	3.40	0.68	0.00	10.0	40.0	50.0
17	Prepare and implement detailed lesson plans.	3.25	0.85	0.00	25.0	25.0	50.0
5	Require the prompt completion of work.	3.05	0.68	0.00	20.0	55.0	25.0
8	Rely on tests and written assessments for student evaluation.	2.90	0.78	5.00	20.0	55.0	20.0
20	Provide opportunities for peer assessment.	2.76	0.96	5.00	45.0	20.0	30.0
16	Group students in classes according to their abilities.	2.60	0.88	10.0	35.0	40.0	15.0
14	Foster competition to encourage quality work.	2.10	0.96	35.0	25.0	35.0	5.00

Grade 3 Importance Subscale—Means and Percentages

		<i>Mean</i>	<i>SD</i>	Not Important	Somewhat Important	Fairly Important	Very Important
2	Establish discipline and management procedures.	4.00	0.00	0.00	0.00	0.00	100
15	Help students take responsibility for their own learning.	3.94	0.00	0.00	0.00	5.90	94.1
11	Recognize and respond to the diverse learning needs of students.	3.67	0.34	0.00	0.00	12.5	87.5
10	Engage students in applications of skills and knowledge in a variety of contexts.	3.82	0.39	0.00	0.00	17.6	82.4
22	Adjust instruction based on the reaction and responses of the class or individual.	3.82	0.39	0.00	0.00	17.6	82.4
21	Use a variety of assessment techniques and strategies.	3.76	0.56	0.00	5.90	11.8	82.4
1	Provide concrete experiences before abstract concepts.	3.70	0.58	0.00	5.90	17.6	76.5
4	Communicate learning goals to the students.	3.70	0.46	0.00	0.00	29.4	70.6
12	Use classroom or informal questioning to assess student understanding.	3.70	0.58	0.00	5.90	17.6	76.5
3	Consider students' prior understanding when planning curriculum and instruction.	3.64	0.60	0.00	5.90	23.5	70.6
13	Make connections between subject area and other disciplines.	3.64	0.60	0.00	5.90	23.5	70.6
18	Engage students in conversations of what constitutes quality work.	3.64	0.78	0.00	5.90	17.6	76.5
19	Practice routine skills.	3.64	0.49	0.00	0.00	35.3	64.7
7	Have students participate in hands-on activities.	3.58	0.61	0.00	5.90	29.4	64.7
9	Provide students with opportunities to reflect on their own learning and understanding.	3.58	0.50	0.00	0.00	41.2	58.8
6	Have students work in cooperative learning groups or teams.	3.35	0.78	0.00	17.6	29.4	52.9
17	Prepare and implement detailed lesson plans.	3.25	0.93	0.00	31.3	12.5	56.3
5	Require the prompt completion of work.	2.94	0.74	0.00	29.4	47.1	23.5
20	Provide opportunities for peer assessment.	2.88	0.69	0.00	29.4	52.9	17.6
8	Rely on tests and written assessments for student evaluation.	2.82	0.72	0.00	35.3	47.1	17.6
16	Group students in classes according to their abilities.	2.58	1.12	23.5	17.6	35.3	23.5
14	Foster competition to encourage quality work.	2.37	1.14	31.3	18.8	31.3	18.8

Appendix F

Tables for Research Question 2

Importance Subscale by 1–5 Years of Experience—Means, Standard Deviations, and Percentages

		<i>Mean</i>	<i>SD</i>	Not Important	Somewhat Important	Fairly Important	Very Important
2	Establish discipline and management procedures.	4.00	0.00	0.00	0.00	0.00	100
7	Have students participate in hands-on activities.	3.92	0.27	0.00	0.00	7.70	92.3
11	Recognize and respond to the diverse learning needs of students.	3.84	0.37	0.00	0.00	15.4	84.6
3	Consider students' prior understanding when planning curriculum and instruction.	3.76	0.43	0.00	0.00	23.1	76.9
15	Help students take responsibility for their own learning.	3.76	0.43	0.00	0.00	23.1	76.9
22	Adjust instruction based on the reaction and responses of the class or individual.	3.76	0.43	0.00	0.00	23.1	76.9
4	Communicate learning goals to the students.	3.69	0.63	0.00	7.70	15.4	76.9
10	Engage students in applications of skills and knowledge in a variety of contexts.	3.69	0.48	0.00	0.00	30.8	69.2
21	Use a variety of assessment techniques and strategies.	3.66	0.65	0.00	8.30	16.7	75.0
12	Use classroom or informal questioning to assess student understanding.	3.61	0.50	0.00	0.00	38.5	84.6
13	Make connections between subject area and other disciplines.	3.61	0.50	0.00	0.00	38.5	61.5
19	Practice routine skills.	3.61	0.50	0.00	0.00	38.5	61.5
6	Have students work in cooperative learning groups or teams.	3.53	0.66	0.00	7.70	30.8	61.5
9	Provide students with opportunities to reflect on their own learning and understanding.	3.53	0.66	0.00	7.70	30.8	61.5
18	Engage students in conversations of what constitutes quality work.	3.53	0.66	0.00	7.70	30.8	61.5
1	Provide concrete experiences before abstract concepts.	3.46	0.66	0.00	7.70	38.5	53.8
5	Require the prompt completion of work.	3.30	0.63	0.00	7.70	53.8	38.5
17	Prepare and implement detailed lesson plans.	3.30	0.86	0.00	23.1	23.1	53.8
8	Rely on tests and written assessments for student evaluation.	2.69	0.63	0.00	38.5	53.8	7.7
16	Group students in classes according to their abilities.	2.46	1.12	30.8	7.70	46.2	15.4
20	Provide opportunities for peer assessment.	2.46	0.87	7.70	53.8	23.1	15.4
14	Foster competition to encourage quality work.	2.38	0.96	23.1	23.1	46.2	7.7

Importance Subscale by 6–10 Years of Experience—Means, Standard Deviations, and Percentages

		<i>Mean</i>	<i>SD</i>	Not Important	Somewhat Important	Fairly Important	Very Important
2	Establish discipline and management procedures.	3.93	0.24	0.00	0.00	6.5	93.5
11	Recognize and respond to the diverse learning needs of students.	3.86	0.34	0.00	0.00	13.3	86.7
15	Help students take responsibility for their own learning.	3.80	0.40	0.00	0.00	19.4	80.6
10	Engage students in applications of skills and knowledge in a variety of contexts.	3.74	0.44	0.00	0.00	25.8	74.2
12	Use classroom or informal questioning to assess student understanding.	3.74	0.51	0.00	3.20	19.4	77.4
7	Have students participate in hands-on activities.	3.70	0.45	0.00	0.00	29.0	71.0
19	Practice routine skills.	3.70	0.52	0.00	3.20	22.6	74.2
21	Use a variety of assessment techniques and strategies.	3.70	0.52	0.00	3.50	22.6	74.2
1	Provide concrete experiences before abstract concepts.	3.67	0.54	0.00	3.20	25.8	71.0
22	Adjust instruction based on the reaction and responses of the class or individual.	3.67	0.54	0.00	3.20	25.8	71.0
4	Communicate learning goals to the students.	3.61	0.71	3.20	3.20	22.6	71.0
3	Consider students' prior understanding when planning curriculum and instruction.	3.58	0.56	0.00	3.20	35.5	61.3
13	Make connections between subject area and other disciplines.	3.58	0.62	0.00	6.50	29.0	64.5
9	Provide students with opportunities to reflect on their own learning and understanding.	3.54	0.56	0.00	3.20	38.7	58.1
18	Engage students in conversations of what constitutes quality work.	3.48	0.75	3.20	6.50	29.0	61.3
6	Have students work in cooperative learning groups or teams.	3.41	0.80	3.20	9.70	29.0	58.1
17	Prepare and implement detailed lesson plans.	3.19	0.74	0.00	19.4	41.9	38.7
5	Require the prompt completion of work.	3.06	0.77	0.00	25.8	41.9	32.3
20	Provide opportunities for peer assessment.	2.74	0.99	9.70	35.5	25.8	29.0
8	Rely on tests and written assessments for student evaluation.	2.70	0.64	0.00	38.7	51.6	9.7
16	Group students in classes according to their abilities.	2.46	0.85	9.70	45.2	32.3	12.9
14	Foster competition to encourage quality work.	2.29	1.21	38.7	16.1	22.6	22.6

Importance Subscale by 11 or More Years of Experience—Means, Standard Deviations, and Percentage

		<i>Mean</i>	<i>SD</i>	Not Important	Somewhat Important	Fairly Important	Very Important
2	Establish discipline and management procedures.	3.96	0.17	0.00	0.00	3.00	97.0
11	Recognize and respond to the diverse learning needs of students.	3.84	0.44	0.00	3.00	9.10	87.9
19	Practice routine skills.	3.81	0.46	0.00	3.00	12.1	84.8
1	Provide concrete experiences before abstract concepts.	3.78	0.48	0.00	3.00	15.2	81.8
10	Engage students in applications of skills and knowledge in a variety of contexts.	3.78	0.41	0.00	0.00	21.2	78.8
3	Consider students' prior understanding when planning curriculum and instruction.	3.72	0.57	0.00	6.10	15.2	78.8
4	Communicate learning goals to the students.	3.72	0.57	0.00	3.10	15.2	78.8
21	Use a variety of assessment techniques and strategies.	3.72	0.51	0.00	3.00	21.2	75.8
7	Have students participate in hands-on activities.	3.69	0.58	0.00	6.10	18.2	75.8
18	Engage students in conversations of what constitutes quality work.	3.69	0.52	0.00	3.00	24.2	72.7
22	Adjust instruction based on the reaction and responses of the class or individual.	3.69	0.52	0.00	3.0	24.2	72.7
12	Use classroom or informal questioning to assess student understanding.	3.63	0.60	0.00	6.10	24.2	69.7
15	Help students take responsibility for their own learning.	3.54	0.61	0.00	6.10	33.3	60.6
9	Provide students with opportunities to reflect on their own learning and understanding.	3.51	0.66	0.00	9.10	30.3	60.6
13	Make connections between subject area and other disciplines.	3.51	0.61	0.00	6.10	36.4	57.6
17	Prepare and implement detailed lesson plans.	3.28	0.92	6.30	12.5	28.1	53.1
5	Require the prompt completion of work.	2.96	0.68	0.00	24.2	54.5	21.2
6	Have students work in cooperative learning groups or teams.	2.96	0.64	3.00	27.3	39.4	30.3
8	Rely on tests and written assessments for student evaluation.	2.87	0.85	6.10	24.2	45.5	24.2
16	Group students in classes according to their abilities.	2.75	0.93	9.10	30.3	36.4	24.2
20	Provide opportunities for peer assessment.	2.75	0.75	3.00	33.3	48.5	15.2
14	Foster competition to encourage quality work.	2.12	0.94	27.3	39.4	21.2	9.1

Appendix G

Tables for Research Question 3

Prekindergarten Implementation Instruction Subscale Items 23–37 Results

		<i>Mean</i>	<i>SD</i>	Never	Rarely	Sometimes	Often	All or Almost All Lessons
33	Demonstrate a problem or procedure	4.10	1.28	10.0	0.00	10.0	30.0	50.0
24	Hold class discussions on topic of instruction	4.00	1.32	11.1	0.00	11.1	33.3	44.4
26	Use open-ended questions during class discussions	3.90	1.19	10.0	0.00	10.0	50	30.0.
27	Allow students to work at their own pace	3.90	1.26	10.0	0.0	20.0	30.0	40.0
28	Facilitate student project work	3.90	1.44	10.0	10.0	10.0	20.0	50.0
32	Embed assessment in regular class activities	3.90	1.19	10.0	0.00	10.0	50.0	30.0
25	Use computers	3.80	1.54	10.0	20.0	0.00	20.0	50.0
37	Allow students to present their work to the class	3.70	1.49	10.0	20.00	0.00	30.0	40.0
34	Require students to explain their reasoning when giving an answer	3.60	1.28	10.0	10.0	20.0	40.0	20.0
35	Use anecdotes or personal stories to convey information	3.40	1.77	30.0	0.00	10.0	20.0	40.0
36	Use assessment to find out what students know before or during a unit	3.40	1.26	10.0	10.0	30.0	30.0	20.0
23	Introduce content through formal presentations	3.00	1.33	20.0	10.0	30.0	30.0	10.0
30	Assign homework	3.00	1.63	30.0	0.00	40.0	0.00	30.0
31	Ask students to write reflections in notebooks or journals	2.70	1.82	50.0	0.00	0.00	30.0	20.0
29	Show a videotape or TV program	2.11	0.78	22.2	0.00	44.4	33.3	0.00

Prekindergarten Implementation Assessment Subscale Items 38–51 Results

		<i>Mean</i>	<i>SD</i>	Never	Monthly	Weekly	Every Day
51	Students' contributions in class discussions	3.70	0.94	10.0	0.00	0.00	90.0
42	Hands-on activities	3.60	0.69	0.00	10.0	20.0	70.0
47	Oral questioning of individual students	3.20	1.13	10.0	20.0	10.0	60.0
46	Anecdotal records or everyday performance	3.00	1.15	10.0	30.0	10.0	50.0
44	Portfolio collections of student work	2.90	1.44	30.0	10.0	0.00	60.0
50	Self- assessment	2.60	1.49	40.0	0.00	20.0	40.0
45	Student notebooks or journals	2.60	1.58	50.0	0.00	0.00	50.0
40	Individual projects or presentations	2.20	1.39	50.0	10.0	10.0	30.0
41	Group projects or presentations	2.20	1.22	40.0	20.0	20.0	20.0
48	Written reflections in (learning) journals	2.10	1.44	60.0	0.00	10.0	30.0
49	Peer assessment	2.10	1.37	60.0	0.00	10.0	30.0
43	Homework	2.00	1.24	50.0	20.0	10.0	20.0
38	Multiple- choice tests	1.40	0.84	80.0	20.0	0.00	0.00
39	Short and long written responses	1.30	0.67	80.0	10.0	10.0	0.00

Kindergarten Implementation Instruction Subscale Items 23–37 Results

		<i>Mean</i>	<i>SD</i>	Never	Rarely	Sometimes	Often	All or Almost All Lessons
34	Require students to explain their reasoning when giving an answer	4.66	0.46	0.00	0.00	0.00	33.3	66.7
27	Allow students to work at their own pace	4.53	0.74	0.00	0.00	13.3	20.0	66.7
25	Use computers	4.46	0.51	0.00	0.00	0.00	53.3	46.7
26	Use open-ended questions during class discussions	4.40	1.12	6.70	0.00	6.70	20.0	66.7
33	Demonstrate a problem or procedure	4.40	0.82	0.00	0.00	20.0	20.0	60.0
31	Ask students to write reflections in notebooks or journals	4.33	1.11	6.70	0.00	6.70	26.7	60.0
37	Allow students to present their work to the class	4.33	0.61	0.00	0.00	6.70	53.3	40.0
30	Assign homework	4.20	0.67	0.00	0.00	13.3	63.3	33.3
35	Use anecdotes or personal stories to convey information	4.00	1.00	6.70	0.00	6.70	53.3	40.0
32	Embed assessment in regular class activities	3.93	0.59	0.00	0.00	20.0	66.7	13.3
36	Use assessment to find out what students know before or during a unit	3.86	1.12	6.70	0.00	26.7	33.3	33.3
24	Hold class discussions on topic of instruction	3.85	0.66	0.00	0.00	26.7	53.7	14.3
23	Introduce content through formal presentations	3.73	0.70	0.00	6.70	20.0	66.7	6.70
28	Facilitate student project work	3.66	0.97	0.00	13.3	26.7	40.0	20.0
29	Show a videotape or TV program	3.06	0.70	0.00	20.0	53.3	26.7	0.00

Kindergarten Implementation Assessment Subscale Items 38–51 Results

		<i>Mean</i>	<i>SD</i>	Never	Monthly	Weekly	Every Day
42	Hands-on activities	3.80	0.41	0.00	0.00	20.0	80.0
45	Student notebooks or journals	3.73	0.79	6.70	0.00	6.70	86.7
51	Students' contributions in class discussions	3.66	0.61	0.00	6.70	20.0	73.3
47	Oral questioning of individual students	3.60	0.63	0.00	6.70	26.7	66.7
48	Written reflections in (learning) journals	3.26	1.22	20.0	0.00	13.3	66.7
46	Anecdotal records or everyday performance	3.06	1.03	6.70	26.7	20.0	46.7
43	Homework	3.00	1.00	13.3	6.70	46.7	33.3
44	Portfolio collections of student work	2.53	0.91	6.70	53.3	20.0	20.0
40	Individual projects or presentations	2.20	0.94	26.7	33.3	33.3	6.70
50	Self-assessment	2.14	0.86	28.6	28.6	42.9	0.00
41	Group projects or presentations	2.06	0.70	26.7	40.0	33.3	0.00
39	Short and long written responses	1.86	1.12	53.3	20.0	13.3	13.3
49	Peer assessment	1.86	0.91	40.0	40.0	13.3	6.70
38	Multiple-choice tests	1.66	0.89	60.0	13.3	26.7	0.00

Grade 1 Implementation Instruction Subscale Items 23–37 Results

		<i>Mean</i>	<i>SD</i>	Never	Rarely	Sometimes	Often	All or Almost All Lessons
25	Use computers	4.78	0.42	0.00	0.00	0.00	53.3	46.7
30	Assign homework	4.73	0.59	0.00	0.00	13.3	53.3	33.3
24	Hold class discussions on topic of instruction	4.53	0.51	0.00	0.00	28.6	57.1	14.3
34	Require students to explain their reasoning when giving an answer	4.46	0.51	0.00	0.00	0.00	33.3	66.7
26	Use open-ended questions during class discussions	4.40	0.63	6.70	0.00	6.70	20.0	66.7
33	Demonstrate a problem or procedure	4.40	0.50	0.00	0.00	20.0	20.0	60.0
27	Allow students to work at their own pace	4.33	0.61	0.00	0.00	13.3	20.0	66.7
31	Ask students to write reflections in notebooks or journals	4.06	0.70	6.70	0.00	6.70	26.7	60.0
35	Use anecdotes or personal stories to convey information	3.86	1.06	6.70	0.00	6.70	60.0	26.7
37	Allow students to present their work to the class	3.86	0.83	0.00	0.00	6.70	53.3	40.0
23	Introduce content through formal presentations	3.76	1.23	0.0	6.70	20.0	66.7	6.70
36	Use assessment to find out what students know before or during a unit	3.73	0.79	6.70	.000	26.7	33.3	33.3
32	Embed assessment in regular class activities	3.66	1.04	0.00	0.00	50.0	66.7	13.3
28	Facilitate student project work	3.53	0.74	0.00	13.3	26.7	40.0	20.0
29	Show a videotape or TV program	3.33	0.81	0.00	20.0	53.3	26.7	0.00

Grade 1 Implementation Assessment Subscale Items 38–51 Results

		<i>Mean</i>	<i>SD</i>	Never	Monthly	Weekly	Every Day
43	Homework	3.60	0.82	6.70	0.00	20.0	73.3
47	Oral questioning of individual students	3.53	0.63	0.00	6.70	33.3	60.0
51	Students' contributions in class discussions	3.40	0.98	6.70	13.3	13.3	66.7
42	Hands-on activities	3.26	0.59	0.00	6.70	60.0	33.3
45	Student notebooks or journals	3.13	0.91	6.70	13.3	40.0	40.0
38	Multiple-choice tests	2.60	0.56	0.00	26.7	86.7	6.7
48	Written reflections in (learning) journals	2.66	0.89	6.70	40.0	33.3	20.0
46	Anecdotal records or everyday performance	2.46	1.06	26.7	13.3	46.7	13.3
39	Short and long written responses	2.13	0.63	13.3	60.0	26.7	0.00
40	Individual projects or presentations	2.06	0.25	0.00	93.3	6.70	0.00
41	Group projects or presentations	1.93	0.45	13.3	80.0	6.70	0.00
44	Portfolio collections of student work	1.93	1.22	53.3	20.0	6.70	20.0
50	Self-assessment	1.93	0.79	33.3	40.0	26.7	0.00
49	Peer assessment	1.73	0.79	46.7	33.3	20.0	0.00

Grade 2 Implementation Instruction Subscale Items 23–37 Results

		<i>Mean</i>	<i>SD</i>	Never	Rarely	Sometimes	Often	All or Almost All Lessons
34	Require students to explain their reasoning when giving an answer	4.35	0.93	0.00	5.0	15.0	20.0	60.0
26	Use open-ended questions during class discussions	4.25	0.71	0.00	0.00	15.0	45.0	40.0
33	Demonstrate a problem or procedure	4.25	0.96	5.00	0.00	5.00	45.0	45.0
25	Use computers	4.10	1.16	5.00	5.00	15.0	25.0	50.0
27	Allow students to work at their own pace	4.10	0.78	0.00	5.00	10.0	55.0	30.0
23	Introduce content through formal presentations	4.00	0.68	0.00	0.00	22.2	55.6	22.2
35	Use anecdotes or personal stories to convey information	3.95	1.14	5.00	5.00	20.0	30.0	40.0
30	Assign homework	3.90	1.58	20.0	0.00	5.00	20.0	55.0
24	Hold class discussions on topic of instruction	3.83	0.98	5.60	0.00	22.2	50.0	22.2
32	Embed assessment in regular class activities	3.80	1.00	5.00	0.00	30.0	40.0	25.0
36	Use assessment to find out what students know before or during a unit	3.75	0.71	0.00	0.00	40.0	45.0	15.0
31	Ask students to write reflections in notebooks or journals	3.80	1.27	5.00	20.0	15.0	30.0	30.0
37	Allow students to present their work to the class	3.60	0.59	0.00	5.00	30.0	65.0	0.00
28	Facilitate student project work	3.30	1.17	5.00	25.0	20.0	35.0	15.0
29	Show a videotape or TV program	2.65	0.96	5.00	50.0	25.0	15.0	5.00

Grade 2 Implementation Assessment Subscale Items 38–51 Results

		<i>Mean</i>	<i>SD</i>	Never	Monthly	Weekly	Every Day
47	Oral questioning of individual students	3.45	0.75	0.00	15.0	25.0	60.0
51	Students' contributions in class discussions	3.40	0.82	0.00	20.0	20.0	60.0
43	Homework	3.25	1.11	15.0	5.00	20.0	60.0
42	Hands-on activities	2.90	0.71	0.00	30.0	50.0	20.0
46	Anecdotal records or everyday performance	2.60	1.09	20.0	25.0	30.0	25.0
45	Student notebooks or journals	2.45	1.09	25.0	25.0	30.0	20.0
48	Written reflections in (learning) journals	2.36	1.16	31.6	21.1	26.3	21.1
39	Short and long written responses	2.25	0.85	20.0	40.0	35.0	5.00
50	Self-assessment	2.21	0.86	21.1	42.1	31.6	5.30
38	Multiple-choice tests	2.20	1.00	35.0	15.0	45.0	5.00
44	Portfolio collections of student work	2.15	1.03	35.0	25.0	30.0	10.0
49	Peer assessment	1.89	0.73	31.6	47.4	21.1	0.00
41	Group projects or presentations	1.85	0.74	35.0	45.0	20.0	0.00
40	Individual projects or presentations	1.80	0.83	40.0	45.0	10.0	5.00

Grade 3 Implementation Instruction Subscale Items 23–37 Results

		<i>Mean</i>	<i>SD</i>	Never	Rarely	Sometimes	Often	All or Almost All Lessons
25	Use computers	4.81	0.40	0.00	0.00	0.00	18.8	81.3
26	Use open-ended questions during class discussions	4.76	0.43	5.9	23.5	47.1	23.5	0.00
34	Require students to explain their reasoning when giving an answer	4.76	0.56	0.00	0.00	5.90	11.8	82.4
24	Hold class discussions on topic of instruction	4.58	0.50	0.00	0.00	0.00	41.2	58.8
33	Demonstrate a problem or procedure	4.52	0.71	0.00	0.00	11.8	23.5	64.7
27	Allow students to work at their own pace	4.41	0.79	0.00	0.00	17.6	23.5	58.8
23	Introduce content through formal presentations	4.35	0.70	0.00	0.00	11.8	42.1	47.1
30	Assign homework	4.29	1.15	5.90	0.00	17.6	11.8	64.7
35	Use anecdotes or personal stories to convey information	4.17	1.13	5.90	5.90	0.00	41.2	47.1
32	Embed assessment in regular class activities	4.05	0.65	0.00	5.90	0.00	76.5	17.6
36	Use assessment to find out what students know before or during a unit	3.70	0.91	0.00	11.8	23.5	47.1	17.6
37	Allow students to present their work to the class	3.58	0.71	0.00	5.90	35.3	52.9	5.90
28	Facilitate student project work	3.47	1.00	0.00	17.6	35.3	29.4	17.6
31	Ask students to write reflections in notebooks or journals	3.41	1.06	5.90	11.8	29.4	41.2	11.8
29	Show a videotape or TV program	2.88	0.85	5.90	23.5	47.1	23.5	0.00

Grade 3 Implementation Assessment Subscale Items 38–51 Results

		<i>Mean</i>	<i>SD</i>	Never	Monthly	Weekly	Every Day
51	Students' contributions in class discussions	3.64	0.70	0.00	20.0	20.0	60.0
43	Homework	3.47	0.94	15.0	5.00	20.0	60.0
47	Oral questioning of individual students	3.41	0.71	0.00	15.0	25.0	60.0
42	Hands-on activities	3.23	0.75	0.00	30.0	50.0	20.0
38	Multiple-choice tests	3.05	0.62	35.0	15.0	45.0	5.00
39	Short and long written responses	2.75	0.65	20.0	40.0	35.0	5.00
45	Student notebooks or journals	2.41	1.22	25.0	25.0	30.0	20.0
46	Anecdotal records or everyday performance	2.41	0.87	20.0	25.0	30.0	25.0
50	Self-assessment	2.35	0.93	21.1	42.1	31.6	5.30
48	Written reflections in (learning) journals	2.35	1.09	31.6	21.1	26.3	21.1
49	Peer assessment	2.11	0.85	31.6	47.4	21.1	0.00
41	Group projects or presentations	1.82	0.63	35.0	45.0	20.0	0.00
44	Portfolio collections of student work	1.82	0.95	35.0	25.0	30.0	10.0
40	Individual projects or presentations	1.76	0.75	40.0	45.0	10.0	5.00

Appendix H

Tables for Research Question 4

0–5 Years of Experience by Implementation Instruction Subscale Items 23–37

		<i>Mean</i>	<i>SD</i>	Never	Rarely	Sometimes	Often	All or Almost All Lessons
33	demonstrate a problem or procedure	4.76	0.43	0.00	0.00	0.00	23.1	76.9
25	use computers	4.69	0.48	0.00	0.00	0.00	30.8	69.2
30	assign homework	4.61	0.76	0.00	0.00	15.4	7.70	76.9
34	require students to explain their reasoning when giving an answer	4.53	0.87	0.00	7.70	0.00	23.1	69.2
26	use open-ended questions during class discussions	4.38	0.65	0.00	0.00	7.70	46.2	46.25
27	allow students to work at their own pace	4.38	0.65	0.00	0.00	7.70	46.2	46.2
24	hold class discussions on topic of instruction	4.23	0.59	0.00	0.00	7.70	61.5	30.8
32	embed assessment in regular class activities	4.07	0.49	0.00	0.00	7.70	76.9	15.4
36	use assessment to find out what students know before or during a unit	4.07	0.75	0.00	0.00	23.1	46.2	30.8
23	introduce content through formal presentations	3.92	0.86	0.00	7.7	15.4	53.8	23.1
35	use anecdotes or personal stories to convey information	3.92	1.11	0.00	15.4	15.4	30.8	38.5
37	allow students to present their work to the class	3.61	0.50	0.00	0.00	38.5	61.5	0.00
31	ask students to write reflections in notebooks or journals	3.38	1.50	7.70	30.8	15.4	7.70	38.5
28	facilitate student project work	2.92	0.95	0.00	38.5	38.5	15.4	7.70
29	show a videotape or TV program	2.69	0.85	7.70	30.8	46.2	15.4	0.00

0–5 Years of Experience by Implementation Assessment Subscale Items 38–51

		<i>Mean</i>	<i>SD</i>	Never	Monthly	Weekly	Every Day
43	Homework	3.69	0.65	3.20	9.70	32.3	54.8
47	Oral questioning of individual students	3.69	0.63	0.00	12.9	35.5	51.6
51	Students' contributions in class discussions	3.53	0.77	0.00	9.70	19.4	71.0
42	Hands-on activities	3.30	0.76	0.00	9.70	41.9	48.4
46	Anecdotal records or everyday performance	2.69	1.25	16.1	32.3	25.8	25.8
38	Multiple-choice tests	2.46	1.13	29.0	22.6	41.9	6.5
45	Student notebooks or journals	2.46	1.26	9.70	12.9	38.7	38.7
48	Written reflections in (learning) journals	2.33	1.30	12.9	29.0	22.6	35.5
44	Portfolio collections of student work	2.15	1.06	32.3	35.5	12.9	19.4
39	Short and long written responses	2.08	1.06	22.6	38.7	35.5	3.20
50	Self-assessment	2.00	0.81	16.7	46.7	26.7	10.0
49	Peer assessment	1.84	0.68	23.3	53.3	10.0	13.3
41	Group projects or presentations	1.69	0.75	9.70	67.7	16.1	6.5
40	Individual projects or presentations	1.53	0.66	12.9	64.5	16.1	6.5

6–10 Years of Experience by Implementation Subscale Items 23–37

		<i>Mean</i>	<i>SD</i>	Never	Rarely	Sometimes	Often	All or Almost All Lessons
25	Use computers	4.50	0.82	0.00	6.70	0.00	30.0	63.3
26	Use open-ended questions during class discussions	4.48	0.62	0.00	0.00	6.50	38.7	54.8
34	Require students to explain their reasoning when giving an answer	4.48	0.62	0.00	0.00	6.50	38.7	54.8
27	Allow students to work at their own pace	4.41	0.67	0.00	0.00	9.70	36.7	51.6
30	Assign homework	4.32	0.97	3.20	0.00	16.1	22.6	58.1
24	Hold class discussions on topic of instruction	4.20	0.88	3.3	0.0	10.0	46.7	40.0
33	Demonstrate a problem or procedure	4.12	0.71	0.00	0.00	19.4	48.4	32.3
31	Ask students to write reflections in notebooks or journals	4.06	0.89	3.20	0.00	16.1	48.4	32.3
37	Allow students to present their work to the class	4.03	0.75	0.00	3.20	16.1	54.8	25.8
23	Introduce content through formal presentations	4.00	0.90	0.0	6.7	20.0	40.0	33.3
32	Embed assessment in regular class activities	4.00	0.77	0.00	3.2	19.4	51.6	25.8
35	Use anecdotes or personal stories to convey information	4.00	1.03	6.50	0.00	12.9	48.4	32.3
36	Use assessment to find out what students know before or during a unit	3.64	0.95	3.20	9.70	22.6	48.4	16.1
28	Facilitate student project work	3.56	0.96	3.20	3.20	48.4	25.8	19.4
29	Show a videotape or TV program	2.96	0.86	3.30	23.3	53.3	13.3	6.70

6–10 Years of Experience by Implementation Assessment Subscale Items 38–51

		<i>Mean</i>	<i>SD</i>	Never	Monthly	Weekly	Every Day
51	Students' contributions in class discussions	3.61	0.66	0.00	15.4	15.4	69.2
42	Hands-on activities	3.38	0.66	0.00	15.4	38.5	46.2
43	Homework	3.38	0.80	0.00	7.70	15.4	76.9
47	Oral questioning of individual students	3.38	0.71	0.00	7.70	15.4	76.9
45	Student notebooks or journals	3.06	0.96	30.8	23.1	15.4	30.8
48	Written reflections in (learning) journals	2.80	1.07	41.7	8.30	25.0	25.0
46	Anecdotal records or everyday performance	2.61	1.05	23.1	23.1	15.4	38.5
50	Self-assessment	2.30	0.87	30.8	38.5	30.8	0.00
38	Multiple-choice tests	2.25	0.96	30.8	7.7	46.2	15.4
39	Short and long written responses	2.19	0.83	33.3	41.7	8.30	16.7
41	Group projects or presentations	2.19	0.70	46.2	38.5	15.4	0.00
44	Portfolio collections of student work	2.19	1.10	30.8	38.5	15.4	15.4
40	Individual projects or presentations	2.16	0.73	53.8	38.5	7.70	0.00
49	Peer assessment	2.13	0.93	30.8	53.8	15.4	0.00

11 or More Years of Experience by Implementation Instruction Subscale Items 23–37

		<i>Mean</i>	<i>SD</i>	Never	Rarely	Sometimes	Often	All or Almost All Lessons
33	Demonstrate a problem or procedure	4.39	1.02	6.10	0.00	3.00	30.3	60.6
34	Require students to explain their reasoning when giving an answer	4.30	1.01	3.00	3.00	12.1	24.2	57.6
26	Use open-ended questions during class discussions	4.27	1.06	6.10	0.00	9.1	30.3	54.5
25	Use computers	4.21	1.15	6.30	3.10	9.40	25.0	56.3
24	Hold class discussions on topic of instruction	4.13	0.93	3.30	0.00	16.7	40.0	40.0
27	Allow students to work at their own pace	4.09	1.01	3.00	3.00	18.2	33.0	57.6
35	Use anecdotes or personal stories to convey information	3.84	1.37	12.1	6.10	9.10	30.3	42.4
28	Facilitate student project work	3.75	1.11	3.00	15.2	12.1	42.4	27.3
23	Introduce content through formal presentations	3.66	1.09	6.10	6.70	20.0	46.7	20.0
30	Assign homework	3.66	1.55	21.2	0.00	12.1	24.2	42.4
32	Embed assessment in regular class activities	3.66	1.08	6.10	9.10	15.2	51.5	18.2
37	Allow students to present their work to the class	3.66	1.02	3.00	12.1	18.2	48.5	18.2
36	Use assessment to find out what students know before or during a unit	3.63	0.02	3.00	3.00	39.4	36.4	18.2
31	Ask students to write reflections in notebooks or journals	3.42	1.41	18.2	6.10	15.2	36.4	24.2
29	Show a videotape or tv program	2.61	0.95	6.10	36.4	27.3	30.3	0.00

11 or More Years of Experience by Implementation Instruction Subscale Items 38–51

		<i>Mean</i>	<i>SD</i>	Never	Monthly	Weekly	Every day
51	Students' contributions in class discussions	3.48	0.93	6.10	12.1	9.10	72.7
47	Oral questioning of individual students	3.42	0.83	3.00	12.1	24.2	60.6
42	Hands-on activities	3.24	0.75	0.00	18.2	39.4	42.4
45	Student notebooks or journals	2.75	1.37	33.3	6.10	12.1	48.5
43	Homework	2.72	1.35	33.3	6.10	15.2	45.5
46	Anecdotal records or everyday performance	2.72	0.97	12.1	27.3	36.4	24.2
48	Written reflections in (learning) journals	2.36	1.24	39.4	9.10	27.3	24.2
38	Multiple-choice tests	2.27	1.06	36.4	9.10	46.5	9.10
50	Self-assessment	2.25	1.07	31.3	28.1	25.0	15.6
44	Portfolio collections of student work	2.24	1.19	39.4	18.2	21.2	21.2
39	Short and long written responses	2.09	1.01	36.4	27.3	27.3	9.10
40	Individual projects or presentations	1.96	0.98	36.4	42.4	9.10	12.1
41	Group projects or presentations	1.81	0.76	39.4	39.4	21.2	0.00
49	Peer assessment	1.78	0.92	48.5	30.3	15.2	6.10

Appendix I

VITA

Diane Lowry was born in Nashville, Tennessee, on June 30, 1952. She attended high school in Nashville, Tennessee, and graduated in 1970. She entered college at Middle Tennessee State University and earned a Bachelors of Science degree in 1975 and a Masters of Education in Special Education in 1977 from the University of Alabama at Birmingham.

Upon graduating from the University of Alabama at Birmingham, she taught special education in the Cobb County school district in Marietta, Georgia. During this time she taught in various classroom settings, including self-contained, resource, and inclusion. In addition, she also supervised special education teachers and provided professional development for the school district.

She is currently an instructor at the University of Mississippi in the Department of Curriculum and Instruction. After accepting the instructor's position, she pursued her doctorate degree. She resides in Oxford, Mississippi, with her husband of 32 years.