TEACHERS' PERCEPTIONS OF FORMATIVE ASSESSMENT

AND ACADEMIC GROWTH

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TEACHERS' PERCEPTIONS OF FORMATIVE ASSESSMENT

AND ACADEMIC GROWTH

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TEACHERS' PERCEPTIONS OF FORMATIVE ASSESSMENT AND ACADEMIC GROWTH

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By

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Abstract

A key strategy to ensure learning is progressing is to integrate formative assessments into the instruction. This study focused on two areas related to formative assessments: the implementation and impact of formative assessments. Specifically, this study explored the perceptions of elementary, middle school, junior high, and high school teachers regarding the implementation and impact of formative assessments. The need for a valid and reliable survey became clear; therefore, much time, effort, and focus went into developing a survey instrument, testing the instrument in pilot settings, and then revising it to ensure the final study would garner results worthy of making predictions and descriptive statements regarding the sample population as well as the educational community at large. The sample population consisted of certified teachers, noncertified teachers and administrators in elementary, middle, junior high, and high schools within the Southwest region of Missouri. Respondents were overall favorable to both scales on the survey—implementation and impact of formative assessments. The results would point to teachers being open to the implementation of formative assessments and ready for the impact of formative assessments. Necessary for these results was professional development of formative assessments and administrative support of the implementation of formative assessments. Data analysis revealed that the number of years taught and the grade level taught made a difference in teacher perceptions. Teacher interviews were conducted after the final teacher survey was administrated for additional insight. Further study is recommended into how formative assessments can impact the academic achievement of students and a desire of life-long learning.

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CHAPTER ONE

INTRODUCTION

Scriven, a leader in the research of educational theory of learning, first investigated in 1967 the effectiveness of what has increasingly been termed *formative* assessment. Bloom pursued the term in 1968 in the book *Learning for Mastery* to consider formative assessment as a tool for improving the teaching-learning process for students ("Formative Assessment and Assessment for Learning", 2015). According to both, Scriven and Bloom, an assessment, whatever its other uses, is only formative if it is used to alter subsequent educational decisions (*Formative Assessment,* 2011). There have been different and often conflicting viewpoints and definitions regarding formative assessment as reported by Black and Wiliam (1998). The concern to educators today is the uncertainty of formative assessments as a product, as a process, or as something that can be bought. It has never been more important that the learner understand the elements of formative assessment. There are four essential elements to the formative assessment process: identification of the learning gap, feedback, student involvement, and progression of learning (Heritage, 2010).

In a review of the formative assessment literature from French-speaking countries, Allal and Lopez (2005) traced the history of formative assessment from original definition of formative evaluation of educational programs, noting that the term assessment had progressively replaced the term evaluation when the objective was student learning in the classroom. Almost half a century ago, Ausubel suggested that the most important factor influencing learning is to ascertain what the learner already knows, to then teach accordingly, and implement formative assessments (Wiliam, 2011a).

Teachers in the modern classroom are encouraged to engage in a continuous process of gathering evidence, making judgments, and adjusting/differentiating instruction for all students when a course begins. One of the earliest researchers of formative classroom assessments and statements was Bloom (1968, 1971). Bloom's mastery learning concept and research incorporated feedback processes after students took brief unit assessments to direct their individual and group learning needs. Changing the relationship between teachers and students, and managing the multitude of these interactions and relationships, is at the heart of effective formative assessment processes. A systemic approach that takes all key stakeholders–students, teachers, and education leaders –into consideration has the best chance for success. Unfortunately, the arrival of formative assessment in the United States was ill-timed. This potentially powerful classroom-based learning and teaching innovation was overshadowed almost immediately by the No Child Left Behind Act (NCLB) of 2002. Under the 2002 law all states were required to test students in reading and math in Grades 3-8 and once in high school. All students were expected to meet or exceed state standards in reading and math by 2014. The law focused on high summative student achievement, not learning. Schools and students were held accountable for students' progress (NCLB, 2002).

Influenced by earlier and less comprehensive, but equally compelling views, the definitive study supporting formative assessment came from Black and Wiliam (1998) of the United Kingdom. Black and Wiliam revealed that student gains impacted by formative assessment practices were among the largest ever reported for educational interventions. The authors reported that teachers given support to implement formative assessment techniques were able to rapidly close student achievement gaps by 50%.

Black and Wiliam agreed that student gains in learning by the utilization of formative assessments were among the largest ever claimed for educational interventions. From their research, Black and Wiliam proposed that effective formative assessment involved teachers adjusting to teaching and learning in response to assessment evidence, students receiving feedback about their learning and advice concerning improvements they can make, and students participating in the learning process through self-assessment.

Popham (2011b) provided another way to scrutinize formative assessment. Popham described it as a process, not just as a particular test. Formative assessments are utilized not just by teachers but by both teachers and students. Formative assessment takes place during instruction and provides assessment-based feedback for those teachers and students. Buffum, Mattos & Weber (2011) depicted formative assessments as time-efficient, objective measures that check student progress. These assessments are used continually throughout the school year to depict student strengths and needs and are employed to guide instruction and intervention. The goal of formative assessment is to assess the development of all learners toward proficiency. But in assessing the development of learners, Heritage (2010) defined formative assessments as a particular kind of measurement instrument rather than a process that is fundamental and indigenous to the practice of teaching and learning. The benefits of implementing formative assessments are the increase in motivation and achievement. Although these interventions are not for grading, formative assessments do help identify what students can achieve with help and what they can accomplish independently. According to Chappuis (2009), once students realize that information from both teacher feedback and their own self-assessments can help them improve, they will process material more

deeply, persist longer, and try harder. Therefore, the intent of this study was to delve deeper into the literature and to analyze teacher responses to survey questions in order to compose a well-rounded understanding of what formative assessment is and its benefit in the classroom.

Theoretical Framework

In 1998 Black and Wiliam published an analysis of research, *Inside the Black Box,* which has become the seminal work on formative assessment in teaching. The authors maintained that education policymakers view the classroom as a black box, where certain inputs are metaphorically fed into the black box, such as the strategies inquiry-based, exit slips, idea spinner, one-word summary, one sentence summary and think-pair-share. Specific outputs, such as more knowledgeable students and higher test scores, are the expected outcomes. With little or no control over what is fed into the black box, what takes place inside the black box rests firmly on the shoulders of the teachers. This revelation is nothing new, and the challenge is even greater in the 21st Century as stakeholders are demanding increased accountability from educators (Black & Wiliam, 1998). The impact on student learning and motivation for lifelong learning gained from experiencing formative assessments, while understanding the cognitive and motivational theories underlying formative assessment, is essential because these theories explain why formative assessment works when it works.

Greenstein (2010a) sourced the theoretical history of formative assessments as beginning by the time of Socrates. Forty years ago formative assessments became a routine practice in the classroom. Educators, having studied groundbreaking essay *Assessment for Learning*, adopted the use of formative assessments as a source of

educational evaluation. Screven used formative and summative assessments to indicate the differences in both the goals for collecting evaluative information and how the information is then used (Greenstein, 2015). Since 1998 Black and Wiliam have believed that there have been different and often conflicting viewpoints about formative assessments. Popham (2008) and Marzano (2009) asserted that assessments are not formative because of the label but because teachers use them to inform instruction. Another leader in education, Heritage (2010), stated that formative assessments are a process used by teachers and students during instruction that provides feedback to adjust ongoing teaching and learning so that students' achievements of intended instructional outcomes will improve. Formative assessment is a robust alloy of several long-standing psychological theories and a key component of effective learning systems in many diverse practical settings.

The challenge of teachers not using formative assessments comes when they do not see a need to use them frequently (Heritage, 2010). Also, teachers have not developed a repertoire of formative assessments to reveal students' understanding. The results would inform teachers' and students' decisions about what to do next on an hour-to-hour, day-to-day basis. Formative assessments would be the answer. The main benefit of formative assessments is the active and intentional learning process that partners the teacher and students to continuously gather evidence of learning with the goal of improving student achievement. This is forming learning. It moves students forward in the learning process (Heritage, 2010).

Implications were drawn from two major aspects of assessment, the first being that the refinement of diagnostic formative assessment models should be based on

research of learning difficulties in the areas of reading and math. The second implication was the investigation of the role of metacognitive processes in formative assessment and in self-assessment (Greenstein, 2010b). The ever-positive benefit of formative assessments that impacts student learning and motivation for lifelong learning is gained from experience of formative assessments.

Statement of the Problem

Teachers are fairly familiar with formative assessments, but the primary challenge comes when they do not see a need to use them frequently during the learning process and therefore developed formative assessments haphazardly. Also teachers have not developed a repertoire of formative assessments that are closely aligned with best practices in order to reveal students' understanding. Formative assessments would inform teachers' and students' decisions when planning learning steps. Teachers cannot see the benefits of formative assessments and increased student achievement without high-quality sustained formative assessment professional development programs. An additional problem arises when teachers discover using formative assessments in one subject area to be easier than in other subject areas. History has shown that a benefit in implementing common assessment is the successful achievement growth of the learner. However, teachers often do not implement formative assessments during the learning process.

Purpose of the Study

Results from this study will inform administrators and educators whether or not the implementation of formative assessments will benefit student learning as well as provide recommendations for instructional direction when using formative assessments. This study will clearly define formative assessments in order to explain purposeful feedback to students and to bridge the gap of student learning and successful achievement. Popham (2015) stated that there is no single officially and universally accepted definition of formative assessment, but educators have drawn the use of the term formative from Michael Screven's 1967 groundbreaking essay about educational evaluation, which distinguishes the difference between summative and formative assessments. This study also aimed to examine how the use of formative assessments is insightful for students in directing their learning in a more in-depth way. The challenges with the success of formative assessments are that teachers do not use them frequently and many times only in one subject area. Teachers overlook the benefits of frequent feedback for student learning, therefore, overlooking the results.

Research Questions

1. What are the perceptions of teachers regarding the implementation of formative assessments?
2. What are the perceptions of teachers regarding the impact on student achievement?
3. What are the differences of perceptions based on
    a. years as an educator;
    b. grade level taught;
    c. size of the school; and

d. school-wide use of formative assessments?

Delimitations/Limitations

1. The limitations of this study included the following:

2. There may have been difficulties in the acquisition of honest answers to the survey questions from teachers.

3. The perception of formative assessments could have been conflicted with common formative assessments.

4. Generalizations of the study will be limited because the comments and feedback of teachers focused on grade levels of middle school, junior high, and high school.

5. Teachers may not have been current with best practices and the best methods of implementing them.

6. Teachers may not have been able to differentiate between formative and summative assessments.

Delimitations of the study included the following:

1. This study consisted of sampling of data of area schools.
2. This study consisted of elementary school teachers through high school and alternative teachers.

Summary

As Popham (2008) asserted, assessments are not formative because of the label but because teachers use them to inform instruction. Different schools in the same district use the same assessments, labeled formative or benchmark or interim, but the

interpretation and application of those assessment results depend largely on the way in which the teacher uses and applies the results of these assessments.

Although teachers sometimes question their lack of influence in the process of formative assessment usage in the classroom, there is a great deal this assessment can do to influence in a profound way. The timely use of formative assessment feedback equates largely to the improving of student achievement. Educators believed that much of the interest in formative assessments in America is a result of Black and Wiliam's (1998) study, *Inside the Black Box* The research on formative assessment is compelling and shows explicitly how formative assessment works to improve learning by helping students internalize the features of good work, by showing them specifically how to improve, and by developing habits of thinking and a sense of competency and so forth.

Conclusion

Assessments are a part of the educational process and formative assessments are a vital component to compelling the student learning progressively forward. The definition of formative assessment varies, but the literature agrees with the outcome of implementing formative assessments in the classroom. This study emphasizes the elements of formative assessments, the importance of using them student to student and student-to-teacher, and the importance of professional development of the implementation of formative assessments.

This study explored the importance of feedback when using formative assessments. An important part of this study was the survey itself. Derived from a valid and reliable pilot, extensive data analysis and numerous iterations provided a valid and

highly reliable survey ready to be used by educators to measure the importance of implementing formative assessments.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

The concept of measuring students' progress in learning in order to determine how and what to teach has existed at least since the time of Socrates (Greenstein, 2010a). However, it was not until 40 years ago that formative assessments became a routine classroom practice. Since 1998, there have been different and often conflicting viewpoints and definitions of formative assessment (Black & Wiliam, 1998). When Black and William (1998) published the article, *Inside the Black Box,* the advancement of formative assessment in today's classrooms and schools began to gain momentum. In the past 2 decades, formal theory about the type of assessment used to further students' developing understandings and to engage students in taking responsibility for their own learning was developed in other countries (Shepard, 2005). The need to define and perceive just what formative assessment is has never been more important to the learner. "This process helps instructors understand their students' day-to-day learning, develop appropriate interventions to improve that learning, and boost students' confidence in their ability to achieve" (Burke, 2010, p.10).

Popham (2008) credited that much of the current interest in formative assessment, especially in the United States and Canada, was spurred by the work of two British researchers, Black and Wiliam. Black and Wiliam (1998) drew heavily on their own extensive research, *Inside the Black Box*, of classroom formative assessment published earlier the same year in a special issue of the Journal Assessment in Education. Black and Wiliam concluded their research report to show conclusively that formative assessment does improve learning. Their findings made a compelling case for formative

assessment. Black and Wiliam's review concluded that there is no other way of raising standards for which such a strong case can be made.

The elements of formative assessment are very clear, simple, and easy to learn, and include

> stressing that teaching and learning are interconnected, setting expectations for classroom practice, providing exemplars, role models, and mentors at all levels, encouraging teacher collaboration to include information about formative assessments, balancing of cognitive and affective brain action, discussing supportive values, beliefs, actions, and structures and assessing results of learning in a balanced and transparent manner.
>
> (Black & William, 1998)

Formative assessment is a robust alloy of several long-standing psychological theories and a key component of effective learning systems in many diverse practical settings but despite increasing political momentum in the United States, the large-scale implementation of formative assessment has remained something of a distant prospect. Formative assessment then is formative to the extent that information from that assessment is fed back to the system (students) and is actually used to improve the performance of the system (students) in some way. Assessment for learning (formative assessment) happens while learning is still underway. These are the assessments that we conduct in real time (Wiliam, 2007). Progress in the United States of America has been beset by scientific issues, namely definitional interpretations and the lack of statistical evidence supporting the large-scale implementation of formative assessment in a way that

is not so elsewhere in the world. Therefore, the lack of use of formative assessments in classrooms generates gaps in communication of teachers.

The review of literature investigates the following characteristics of formative assessments: definition, importance, best practices, and advantages. The literature review discusses the implementation process of formative assessments and reveals the benefits of formative assessments for teachers. An examination of feedback, professional development, and cultural change concludes the literature review.

Formative Assessment Defined

When defining formative assessments, Popham (2011b) stated that there is no single officially and universally accepted definition of formative assessment. Educators have drawn the use of the term formative from Michael Screven's 1967 groundbreaking essay about educational evaluation, in which he defined formative assessment as an evaluation while a program is ongoing but which is capable of being improved because of an evaluation's results. Therefore, formative assessment is utilized to immediately determine whether or not students have learned what the instructor desired. This type of assessment is intended to help instructors identify material that needs to be clarified or retaught and should be used to evaluate or grade students. Results of formative assessment can assist instructors as they ascertain whether or not curriculum or learning activities need to be modified during a class session or before the next class meets. Finally, formative assessment, which is conducted while an educational event or procedure is occurring, yields information substantially different from that obtained in summative assessment.

The real purpose of formative assessments is to identify the differences between what has been taught and what has been learned in the classroom. This gap needs to be discovered during a student's course of study when interventions can be executed by educators and /or students to remedy the situation. Assessments aim to inform, improve, and/or prove the quality of student performance during the learning process. Formative assessments are well organized in order to improve student learning that relies on evaluation to provide students with feedback and positively affect achievement. Three attributes of effective formative assessments as stated by the Council of Chief State School Officers include the following: learning progressions should clearly articulate the subgoals of the ultimate learning goal; these learning progressions show the course students should follow to achieve goals within the "big picture" of the discipline; and teachers should help students set short-term goals within these learning progressions in order to track progress (Heritage, 2010).

Etymology and common usage associate the adjective, *formative* with forming or molding something, usually to achieve a desired end. The term *assessment* refers to any appraisal (or judgment or evaluation) of a student's work or performance. Formative assessment is not a test but a planned process involving a number of different activities. Hattie (2008) cited decades of research that revealed that feedback was among the most powerful influences on achievement, acknowledging that the student has struggled to understand the concept. Many writings on the subject do not even attempt to define the term, but to improve formative assessment practices among both teachers and assessment designers, it is imperative to look more closely at the concept of feedback.

Formative assessment is a planned process in which teachers or students use assessment-based evidence to adjust their current practice. Formative assessment is an active and intentional learning process that partners the teacher and students to continuously and systemically gather evidence of learning with the expressed goal of improving student achievement (Brookhart, 2011). Formative assessment forms learning and is an assessment that provides information that moves the students forward. If no further learning occurred, then whatever the intention, the assessment was informative. All teachers use assessments in every class they teach. But there are three important questions that teachers should ask themselves when using the process of formative assessments. These questions need answers which help to reduce the learning gap: (a) Is there evidence that improving formative assessment raises standards? (b) Is there evidence that there is room for improvement? (c) Is there evidence about how to improve formative assessment? (Popham, 2008). The teacher's role in formative assessment is not simply to use feedback to promote content learning, but also to help students understand the learning goal, assist students to develop the skills to make judgments about their learning in relation to the standard, and establish a repertoire of operational strategies to regulate their own learning.

A major argument by Hattie (2009) was the power of feedback for teachers to determine what is happening in their classrooms so that they could ascertain how they were doing. The more important concern is for teachers to discover the formative effects of their teaching including the practice of feedback. Thorndike (1913) stated feedback to be usually identified with knowledge of results, a concept that gained considerate thought through Thorndike's so-called Law of Effect. This feedback can foster a lifelong skill of

learning how to learn that is a prerequisite for success in college and in the workplace. Feedback becomes formative when students are provided with scaffolded instruction or thoughtful questioning that serve as prompts for sustained and deeper discussion. This instructional approach closes the gap between their current level of understanding and the desired learning goal (Clark, 2011).

Formative assessments are used to inform instruction. They provide information about how a student is progressing during instruction so that actions or reactions can occur to modify instruction. Formative assessments enable teachers to improve instruction before it is too late to improve student learning. The information gleaned from the assessment is meant solely to discover student progress and mastery at that particular point in time so that the teacher can assess where student gaps occur in learning and adjust instruction accordingly (Guskey, 2015).

Ultimately, formative assessment is a process, not a particular test used not just by teachers but by both teachers and students, which takes place during instruction; provides assessment-based feedback to teachers and students and has the function of feedback. This is to help students and teachers to make adjustments that will improve students, achievement of intended curricular aims (Marzano, 2009). Formative assessments is a process used by teachers and students during instruction that provides feedback to adjust teaching and learning strategies to improve students' achievement of intended instructional outcomes. The power of formative assessments is that of high-leverage strategies for improving student learning. Formative assessments advance and motivate students, rather than merely reporting on student learning. The goals and feedback of formative assessments provide students with specific insights regarding how they can

improve their learning and how their growth can help them to build confidence as learners.

Importance of Formative Assessments

Teachers who utilize the full power of formative assessment understand that formative assessment begins with individual students taking responsibility for and monitoring their own individual learning. Black and Wiliam (1998) put the importance of formative assessments this way:

> There is a firm body of evidence that formative assessment is an essential feature of classroom work and that development of it can raise standards. There is no other way of raising standards for which such a strong case can be made on the evidence of such large learning gains (p.19).

Sadler (1989) stated students become conscious of what they are doing by explaining their decisions to other students. Students then learn new concepts for solving problems by collaborating together. Because students should become progressively more independent and self-confident, they need to evaluate each other's work and their own work frequently, a practice that teaches constructive criticism. Sadler believed in order to develop self-assessment skills and achievement gap-closing strategies, there is a need to move towards self-monitoring found in implementing formative assessments.

Reeves (2008) put the importance of formative assessments to be that of sustainable change depending not upon compliance with external mandates or blind adherence to regulation, but rather upon the pursuit of the greater good for student achievement. Formative assessments implemented during the school day are used to

inform teaching and learning and have a greater impact on improving achievement than any other form of test. Assessment is of central importance in education, and yet there is a lack of commonality in the definition of the terminology relating to it. Development of both theoretical and practical applications will suffer unless there is coherence and agreement in the definition of the terms. Assessment for learning or formative assessment is increasingly being emphasized (Reeves, 2010).

Black and Wiliam (1998) stated, "The improvement of formative assessment cannot be a simple matter. There is no 'quick fix' that can be added to existing practice with promise of rapid reward" (p. 14). The researchers provided details for implementation that included learning from development. Teachers need a variety of living examples of implementation from teachers with whom they can identify and see concrete examples of what doing better means in practice. In a situation such as this, the following characteristics would need to be addressed during implementation: (a) low key at first, (b) general encouragement in light of existing practices, (c) wider dissemination would be pursued later in the program, and (d) emphasis on slow development throughout. The point of friction among personal conflicts includes powerful feelings of being overwhelmed and of insecurity, guilt, frustration, and anger. All features in the educational system that actually obstruct the development of effective formative assessment should be examined to see how their negative effects can be reduced (Black & Wiliam, 1998).

Teachers have to undertake some summative assessment for parents and end-of-year reports. However, the task of assessing pupils summatively is different from the task of assessing ongoing work to monitor and improve progress. Some teachers argue

these two types of assessment are so different that they should be kept apart. From the information that teachers gather for formative purposes, they should, with selection and reinterpretation, be in a strong position to contribute to a fair summative report on each pupil. However, there are very difficult problems for teachers in reconciling their formative with their summative roles, and it is also evident from several evaluation studies of teachers' assessment practices in the United Kingdom in recent years that confusion in teachers' minds between the roles has impeded progress (Wiliam, 2011a). Whether feedback is just there to be grasped or is provided by another person, helpful feedback is goal-referenced, tangible, and transparent; actionable; user-friendly (specific and personalized); timely; ongoing; and consistent (Wiggins, 2013). As pointed out, enhancing the quality of learning through improved formative feedback takes classroom time and is in conflict where teachers feel pressure to cover a statutory curriculum. An important contribution would be a reduction in the content of that curriculum when revised.

Educators may find it difficult to set out a list of research questions that would justify further research in the area of formative assessments. The underlying reason for this is that, despite the many and varied reports of successful innovations, educators fail to give clear accounts on important details about the actual classroom methods used, about the motivation and experience of the teachers, about the nature of the tests used as measures of success, or about the expectations of the pupils involved. Enough is known to provide a basis for active development work, and some of the most important questions can only be answered in a program of practical application (Wiggins, 2013). Black and Wiliam (1998) put the importance of this point in perspective: "Practice in a

classroom is formative to the extent that evidence about student achievement is interpreted and used by teachers and learners, to make decisions about the next steps in instruction that are likely to be better, or better founded, than the decisions they would have taken in the absence of the evidence elicited" (p. 24).

Reeves (2010) stated research agrees that formative assessments promote efficiency for teachers: promotes equity for students, provides an effective strategy for determining whether the guaranteed curriculum is being taught and more importantly, learned: informs the practice of individual teachers: builds a team's capacity to improve its program, facilitates a systematic, collective response to students who are experiencing difficulty: and offers the most powerful tool for changing adult behavior and practice. The most important thing to be taken away from this discussion of formative assessment is the understanding that no single principle makes assessment formative. It is through the weaving together of all principles that high-quality formative assessment arises, and the blending of assessment and teaching occurs. Truly, the evidence is overwhelming that formative assessments are essential as a mechanism for providing effective feedback (Reeves, 2010).

Formative Assessment Best Practices

For Black and Wiliam (1998) formative assessment was not an instrument or an event, but a collection of practices with a common feature, which lead to action that improves learning. There are four essential elements for the formative assessment process: 1) "identification of the learning gap; 2) feedback; 3) student involvement; and 4) progression of learning" (Heritage, 2010, p. 4). This alone is a powerful argument for formative assessment, as Clark (2010) stated when this process includes the following:

(a) establishment of a classroom culture that encourages interaction and the use of assessment tools, (b) use of varied instruction methods to meet diverse student needs, and (c) use of varied approaches to assessing student understanding. Additionally, "innovations that include strengthening the practice of formative assessment produce significant and often substantial learning gains" (Black & Wiliam, 1998, p. 16). This conclusion has changed the face of assessment today. It is in large part responsible for the widespread focus in education on the particular kind of assessment known as formative.

Another leader in education, Heritage (2010), described formative assessment as, "a process used by teachers and students during instruction that provided feedback to adjust ongoing teaching and learning to improve students' achievement of intended instructional outcomes" (p. 9). Subsequently Goodrich (2012) described ongoing frequent measurements of a student's understanding as, "a way for teachers and parents to gauge how students are doing as they are learning what is being assessed" (p. 15). In contrast O'Connor (2011) defined formative assessments as an assessment for learning that can broadly be described as a snapshot or a dipstick measure that captures a student's progress through the learning process. The formative assessment process explains to what extent a student is learning a concept, skill, or knowledge set. In a sense, a formative assessment is practice that is not heavily weighted in the grading system (O'Connor, 2011).

Sadler (1989) asserted a key premise of formative assessments is for students to improve and that they must have the capacity to monitor the quality of their own work during actual production. This requires students to possess an appreciation of high-

quality work and the evaluative skill necessary to compare with objectivity the quality of what they are producing in relation to the higher standard. Sadler noted that students using formative assessment data developed a store of tactics or moves that could be drawn upon to modify their own work. Instructional systems that do not make explicit provision for the acquisition of evaluative expertise are deficient since they set up artificial and potentially removable performance ceilings for students.

The buzzword for such ongoing checking for understanding is formative assessment, as opposed to summative assessment. Summative assessment is used at the end of a unit or grading period. Contrary to summative assessment is formative assessment, a critical element in creating successful schools. British educators Wiliam and Black (2011a) credited the consistent delivery of lessons that include multiple checks for understanding as possibly the most powerful, cost-effective action educators can take to ensure learning. Solid research, *21st Century Tools to Revitalize Teaching and learning* (Lent, 2012), demonstrated that students learn as much as 4 times as quickly from such lessons.

Reeves (1998) stated formative assessment to be more valuable for day-to-day teaching when it is used to adapt the teaching to meet students' needs. Formative assessment helps teachers to monitor each student's progress and to modify the instruction accordingly. Formative assessment also helped students to monitor their own progress as they received feedback from their peers and the teacher. Students also found opportunities to revise and refine their thinking by means of formative assessment. Formative assessment is also called educative assessment or classroom assessment. Brookhart's (2011) analogy of formative assessments: a best practice is to view using

these types of progress-monitoring tools as practice quizzes along the way. Brookhart (2011) :analogy of formative assessments was this: believed students must have continued opportunity to identify gaps in knowledge and skills before given the graded test.

A culminating definition of formative assessment is that of a way of evaluating student work while it is still in progress. Formative assessment creates an as-you-go feedback loop. This has two goals: first it lets the instructor rethink, tailor, or reteach concepts that have not been understood: secondly, it gives students the ability to shore up their understanding at various points in their learning (Fontichiaro, 2011). Using at least one formative assessment daily per subject enables educators to evaluate and assess the quality of the learning that is taking place in the classroom and to answer these driving questions: How is this student evolving as a learner? What can the teacher do to assist this learner on his path to mastery? The determining factor is not necessarily the type of assessment the teachers use but rather how teachers and students use the information.

Educational Benefits of Formative Assessments

Since implementation of No Child Left Behind (NCLB, 2002), state educators have assessed students annually in English language arts and mathematics with tests that survey a broad spectrum of content. Under the 2002 law, states were required to test students in Grades 3-8 and once in high school. All students were expected to meet or exceed state standards in reading and math by 2014. The major focus of NCLB was to close student achievement gaps by providing all children with a fair, equal, and significant opportunity to obtain a high-quality education. President George W. Bush's NCLB law formally expired on September 30, 2007 (Hensley-Clancy, 2007).

Educators' focus is to be engaged in a continuous process of gathering evidence, making judgments, and adjusting/differentiating instruction for all students when a course begins. Changing the relationship between teachers and students and managing the multitude of these interactions and relationships is at the heart of effective formative assessment processes. Focusing on student-centered activities, the student is able to relate the material to his/her life and experiences. The student is encouraged to think critically and develop analytical skills. The use of formative assessments is a systemic approach that takes all key stakeholders-students, teachers, and education leaders--into consideration. Practice in a classroom is formative to the extent that evidence about student achievement is elicited, interpreted, and used by teachers, learners, or their peers to make decisions about the next steps in instruction that are likely to be better, or better founded, than the decisions. Formative assessment serves several purposes, including to provide feedback for teachers; to modify subsequent learning activities and experiences; to identify and remediate group or individual deficiencies; to move focus away from achieving grades and onto learning processes, in order to increase self-efficacy and reduce the negative impact of extrinsic motivation; to improve students' metacognitive awareness of how they learn; and to allow fine-tuning of instruction and student focus on progress (Fisher & Frey, 2010).

The main benefit of formative assessments is the active and intentional learning process that partners the teacher and students and encourages them to continuously gather evidence with the goal of forming learning and improving student achievement. However, the challenge for teachers who are not utilizing formative assessments and the documentation of meaningful information materializes when those teachers do not see a

need to use those assessments frequently (Heritage, 2010). Another problem occurs when teachers have not developed a repertoire of formative assessments to reveal students' understanding; thus, those teachers and students are denied the decisions that would guide what steps to take on an hour-to-hour, day-to-day basis.

Across the country school districts are being encouraged to promote formative assessment as a powerful improvement strategy, but educators lack guidance about what type and how to implement formative assessment. Wiliam (2011b) noted formative assessment needs to be embedded in the day-to-day life of the classroom and integrated the curriculum scheme being used. Black and Wiliam (1998) examined a broad array of formative assessment data and processes. Practices yielding the largest achievement gains displayed the following characteristics: (a) use of classroom discussions, classroom tasks, and homework to determine the current state of student learning/understanding; (b) action to improve learning/correct misunderstandings; (c) provision of descriptive feedback, with guidance on how to improve during the learning; and (d) development of student self-and peer-assessment skills.

The belief that the expanded use of formative assessments will lead to significant gains in student learning is based in part on the review of 250 studies that revealed significant benefits from the introduction of formative assessment in a variety of educational settings (Black & Wiliam, 1998). Formative assessments became popular after Black and Wiliam (1998) summarized the findings from those 250 studies and drew the following conclusions:

> The research reported here showed conclusively that formative assessment does improve learning. The gains in achievement appear

> to be quite considerable, and as noted earlier, among the largest ever reported in educational interventions. As an illusion of just how big these gains are, an effect size of 0.7, if it could be achieved on a nationwide scale, would be equivalent to raising the mathematics attainment score of an average country like England, New Zealand or the United States into the top five after the Pacific countries of Singapore, Korea, Japan and Hong Kong. (p. 11)

Traditionally, educators have used assessments to measure how much our students have learned up to a particular point in time. Formative assessments support learning during the learning process. Formative assessment helps teachers consider each student's learning needs and styles and adapt instruction accordingly. Additionally, these assessments track individual student achievement, provide appropriately challenging and motivational instructional activities, design intentional and objective student self-assessments, and offer all students opportunities for improvement (Greenstein, 2010a). Venables (p. 14) referred to data that describes formative assessment: "Formative data provide information about how students are learning during instruction so that actions—or, more specifically, reactions—can occur to modify instruction based on that information".

Influenced by an earlier and less comprehensive body of work by Black and Wiliam (1998) it was found that student gains impacted by formative assessment practices were "among the largest ever reported for educational interventions" (p. 19). William (2011a) reported that teachers given supports to implement formative assessment techniques were able to rapidly close student achievement gap by 50%. Black and

William (1998) agreed that student gains in learning by the utilization are among the largest ever claimed for educational interventions. From their research, Black and Wiliam proposed that effective formative assessment should involve teachers making adjustments to teaching and learning in response to assessment evidence, students receiving feedback about their learning and advice on what they can do to improve, and students' participation in the process through self-assessment. Popham (2008) described formative assessment as a process, not any particular test. It is used not just by teachers but by both teachers and students. Formative assessment is implemented during instruction and provides assessment-based feedback for teachers and students within instructional time.

Buffum et al (2011) described formative assessments as "time-efficient", objective measures that check student progress. These assessments are used continually throughout the school year to identify student strengths and needs and are utilized to guide instruction and intervention. The purpose of formative assessment is to gauge the development of all learners toward proficiency.

One of the earliest researchers of formative classroom assessment was Bloom. Bloom's mastery learning concept and research incorporated feedback processes after students took brief unit assessments to direct their individual and group learning needs (Greenstein, 2010b). Understanding the cognitive and motivational theories underlying formative assessment is essential because these theories explain why formative assessment works when it works. Greenstein ascertained formative assessment to supporting the brain in making connections by linking prior knowledge process to new learning, putting together parts and wholes, and providing opportunities to process

information in different ways. Formative assessment and its accompanying use of goal setting, scaffolding, positive feedback, and self-efficacy boosts students' confidence in their ability to achieve. This will lay the groundwork for successful academic outcomes. In other words, according to Chappuis (2009), formative assessment, effectively implemented, can do as much or more to improve student achievement than any of the most powerful instructional interventions, such as intensive reading instruction, one-on-one tutoring, and the like.

To tap the full potential of formative assessments, teachers must clarify and share learning intentions and criteria for success with students: engineer effective classroom discussions, questions, and learning tasks: provide feedback that moves learners forward: activate students as the owners of their own learning: and encourage students to be instructional resources for one another. Although the necessary changes in classroom practice are often apparently quite modest, they are actually difficult to achieve. To bring these changes about schools will need to invest in a new kind of teacher professional development (Wiliam, 2010).

Implementation of Formative Assessments

Advice, evaluation, and grades do not provide the descriptive information that students need to reach their goals of academic achievement. A process that does increase student achievement is formative assessments and feedback. Historically, educators have worked in isolation. Educators have followed this routine: teach, test, issue grades, and repeat with new material. Formative assessment, consisting of feedback and opportunities to use that feedback, enhances performance and achievement. Any practice that gathers information for the purpose of improving teaching and learning is a part of

formative assessment. Interrelated elements of formative assessment include shared learning targets and criteria for success, feedback that feeds forward, student self-assessment, student goal setting, strategic teacher questioning, and student engagement in asking effective questions (Burke, 2010).

The challenge for teachers not using formative assessments comes when they do not see a need to use them frequently. Also teachers have not developed a repertoire of formative assessments to reveal students' understanding. The results would inform teachers' and students' decisions about how to proceed forward on an hour-to-hour, day-to-day basis. Formative assessments bring data to the teacher and feedback for the student and form learning. The basic aim of mastery learning is that formative assessment, followed by feedback and correction, will allow all students to attain the instructional objectives. The main benefit of formative assessments emphasizes the active and intentional learning process that partners the teacher and students to continuously gather evidence of learning with the goal of improving student achievement. This is forming learning. This process moves students forward. Frequent use of formative assessments supports brain connections (Heritage, 2010).

Burke (2010) declared that what distinguishes humans is their ability to stand back and examine their thoughts while engaged in them. This capacity is called metacognition, students thinking about their own thinking. Metacognition is critical to formative assessments. Students who are able to reflect and internalize their mistakes are developing metacognitive skills, which are important goals for life-long learning.

Heritage (2010) explained formative assessments as "a particular kind of measurement instrument, rather than a process that is fundamental and indigenous to the

practice of teaching and learning" (p. 17). The benefits of implementing formative assessments are the increase in motivation and achievement. Although these interventions are not for grading, they do help identify what students can do with help and what they can do independently. Once students realize that information from both teacher feedback and their own self-assessment can help them improve, they will process material more deeply, persist longer, and try harder.

Black and Wiliam (1998) believed that assessment practices in the classroom can be obstacles to learning, that assessment practices in the classroom are at fault. Obstacles include tests that encourage rote and superficial learning, despite the claim that educators want to develop higher order thinking skills. Additionally, grades are overemphasized, while efforts to recognize student problems and provide useful advice to students are not emphasized enough. The presentation and quantity of work is stressed over its quality with respect to learning. Furthermore, the accumulation of grades is given a higher priority than the analysis of student work to determine learning needs and assessment feedback often results in students being compared with each other, which sends them the message that they are in a competition.

Hull, Miles, and Balka (2014) indicated formative assessments are a key factor to effective instructional change and improving student learning and supporting rigor. This is because the focus is now on student actions first and then teacher reactions. Formative assessment focuses on gathering information about student understanding, and then teachers use the information to transform their instruction in addressing issues as they arise. Meeting the demands for increased student learning and coping with the increasing pressure related to student performance, teachers must focus on two dimensions of

formative assessment, understanding current student learning and providing appropriate feedback and intervention (Rutherford, 2009).

Reeves (2011) believed teachers must be willing to confront a number of obstacles when changing to a system of true formative assessment to gain the most benefit of improving learning. First, some teachers may have to alter their beliefs about learning and the learning potential of students. According to Reeves, educators must be willing to reject the transmission model, which asserts that when knowledge is conveyed effectively, student understanding will follow. There is an abundance of evidence (Trumbull & Gerzon, 2013) that this does not work. Most teachers accept that good teaching involves interaction, which is a prerequisite to formative assessment. Another belief that obstructs achievement through formative assessment is when teachers make the assumption that each student has a fixed rather than untapped potential for learning. Teachers who believe that so-called ability is a complex set of skills that can be learned and are able to diagnose and tactfully treat both the cognitive and confidence problems of their students will be more likely to implement formative assessment successfully in their classrooms. Formative assessment is tightly linked with instructional practices. Fisher and Frey (2010) added, to increase teacher expectations, tune the curriculum, and inform instruction is to use formative assessments. Marshall (2009) concluded that if teachers understand why students are not learning, they can fine-tune future teaching so learning is more efficient next time. Addressing these obstacles can ensure benefits for the teaching and learning process (Marshall, 2009).

Benefits of Formative Assessment for Teachers

In public schools, formative assessment is used to inform the next steps in learning. Teacher and students both use formative assessments as a tool to make decisions based on data. Formative assessment occurs when teachers feed information back to students in ways that enable the student to learn better, or when students can engage in a similar, self-reflective process. Formative assessment is particularly effective for learners who have not done well in school, thus narrowing the gap between high and low achievers while raising overall achievement. The persistence of these educational achievement gaps imposes on the United States the economic equivalent of a permanent national recession. The recurring annual economic cost of the international achievement gap is substantially larger than the deep recession the United States currently being experienced. The annual output cost of the racial, income, and regional or systems achievement gap was larger than the U.S. recession of 1981-1982 (Jacobs, 2010). Narrowing the gap between high and low achievers while raising overall achievement is of the utmost importance. In order to show students how to close the gap between where they are academically and where they want to be, teachers must help students evaluate their progress in the learning process and give them explicit, descriptive feedback specific to the learning task. This process can be facilitated with the implementation of formative assessments. Formative assessments take into consideration each student's learning needs and styles and allow teachers to adapt instruction accordingly. This type of assessment tracks individual student achievement, giving teachers the impetus to provide appropriately challenging and motivational instructional activities. Formative

assessments allow for the design of intentional and objective student self-assessments in order that students have opportunities for improvement (Jacobs, 2010).

Formative assessment allows teachers support learning for every age and grade level in every subject during each minute of every school day (Clark, 2011). The formative assessment process can raise teacher quality. The greatest value in formative assessment lies in teachers and students making use of results to improve real-time teaching and learning at every turn. Greater learning occurs when assessments focus on deep learning rather than surface or memorization approaches to learning. For teachers, benefits of formative assessments are students are motivated to learn, students take responsibility for their own learning, students can become users of assessment alongside the teacher, and students learn valuable lifelong skills such as self-evaluation, self-assessment, and goal setting (Marzano, 2009). Black and Wiliam drew additional conclusions concerning the benefits of implementing formative assessments: the success of formative assessment is highly related to how teachers use it to adjust teaching and learning practices, effective learning is based on active student involvement, enhanced feedback is crucial to improved outcomes, and there is a link between formative assessment and self-assessment (Greenstein, 2015).

Improving teacher quality is a benefit described by Wiliam. Getting teachers to make more use of formative assessment or assessment for learning (AfL) has a much greater benefit for teacher content knowledge than any other strategy for teacher improvement. The focus on formative assessment can generate as much as 8 extra months of teacher knowledge per year per classroom. This is around 20 times as cost-effective as class size reduction (Wiliam, 2009). Another benefit of formative assessments is that they

support the brain in making connections by linking prior knowledge to new learning, putting together parts and wholes, and providing opportunities to process information in different ways. Understanding the cognitive and motivational theories underlying formative assessment is essential because these theories explain why formative assessment works when it works (Black & Wiliam, 1998).

Feedback: A Powerful Component of Formative Assessments

Formative assessments function correctly when the feedback information is implemented. "Feedback, of formative assessments, given to students in class is like so many bottles thrown into the sea. No one can be sure that the message they contain will one day find a receiver" (Wiliam, 2010, p. 5). Feedback is recognized as the heart of effective learning.

Clark (2010) offered that the starting point when working on formative assess is with feedback, but not all feedback is formative. Feedback becomes formative when students are provided with thoughtful questioning that serves as a prompt for further enquiry. Feedback must support learning by telling students how or why they need to think about their own thinking, improve and initiate their own thinking, or understand the relationship between the students' previous performance and their current understanding.

Rutherford (2014) developed seven tools for developing teachers and teaching, which is a set of practices for providing growth, non-evaluative feedback, and coaching to teachers. The seven tools are, "30 second feedback, five-minute feedback, reflective planning, positive reinforcement coaching, instructional coaching, small group coaching, and teaching studies" (Rutheford, 2014, p.1) Emphasizing feedback, Rutherford stated, to increase student persistence the teacher should deliver abundant, immediate, and specific

knowledge and feedback of student work in order to improve student achievement. Reeves (2011a) stated the evidence is overwhelming for formative assessment to be essential as a mechanism for providing effective feedback to students and teachers. What makes formative assessments formative is that they are immediately used to make adjustments so as to form learning (Shepard, 2005).

Feedback, according to Black and Wiliam (1998), requires that any "pupil should be about the particular qualities of his or her work, with advice on what he or she can do to improve, and should avoid comparisons with other pupils" (p. 42). Clark (2010) indicated feedback is a powerful instructional approach. Formative feedback on how to perform a task more effectively and when students are provided scaffolded instruction or thoughtful questioning serves as prompts for sustained and deeper discussion. Bloom (as cited in Sadler, 1989) examined several issues relating to formal assessments, the most basic being the importance of feedback. Bloom described feedback as a corrective condition for all important components of learning. Black and Wiliam made several suggestions for effective implementation of formative assessments. There is a need for teachers to pay close attention to the nature, contextualization, and timing of formative assessments. If implemented incorrectly, formative assessments can have negative outcome, and if paired with a more summative model of assessment, they can be ineffective. Formative assessments should not include too many recall/rote activities, and teachers involved in formative assessment models should not emphasize grading over learning. In the formative assessment model, there should be more of a cooperative and less of a competitive classroom atmosphere. Additionally, teachers must make sure to focus on quality rather than quantity. To be truly helpful to students, feedback in the

formative assessment model should be focused on the task, not the student, and the student must understand the feedback so as to make use of it. Teachers must guide students through the process of learning to self-assess and understand both peer and teacher feedback, and teachers should provide opportunities for students to express their understanding and conduct classroom dialogue that focuses on exploring understanding and feedback, which includes opportunities to improve and guidance on how to improve (Black & Wiliam, 1998).

Hattie (2009) believed feedback to be the most valuable when it initiates with the student and is then given to the teacher. When teachers seek, or at least are open to, feedback from students as to what students know, what they understand, where they make errors, when they have misconceptions, or when they are not engaged, then teaching and learning can be synchronized and powerful. Feedback to teachers helps make learning visible (Hattie, 2009). Hattie also believed monitoring, assessing, and evaluating the progress of teaching and learning is what leads to the power of feedback. Feedback to students involves providing information and understanding about the tasks that make the difference in light of what the student already understands, misunderstands, and constructs. Feedback from students to teachers involves information and understanding about the tasks that make the difference in light of what the teacher already understands, misunderstands, and constructs about the learning of his/her students. Formative assessments when done well are one of the most powerful, high-leverage strategies for improving student learning that is known. Educators use formative assessments to become more skilled and focused at assessing, disaggregating, and using student achievement as a tool for ongoing improvement (DuFour & DuFour, 2006).

Feedback can reduce gaps in learning; gaps occur when there is a gap between what the student is currently learning and his/her desired goals. Closing this gap (Sadler, 1989) includes the following: (a) give students feedback and have them use it to set goals, (b) have students graph or describe their progress on specific learning goals, and (c) ask students to comment on their progress. An important feature of Sadler's (1989) definition of feedback is that information about the gap between actual and reference levels is considered as feedback only when it is used to alter the gap. Heritage (2010) supported feedback in the progress of reducing the gap in learning by describing feedback as the "decisive element to assist learning" (p. 9). Formative assessment serves as a feedback loop to close the gap between the learner's current status and desired goals. Information itself is not necessarily feedback unless it is actively used to alter the gap.

Feedback also becomes formative when students are provided with scaffolded instruction or thoughtful questioning that serves as prompts for sustained and deeper discussion This instructional approach closes the gap between the current level of understanding and the desired learning goal (Clark, 2011). Feedback includes dialogue. Dialogue between pupils and a teacher should be thoughtful, reflective, focused to evoke and explore understanding, and conducted so that all pupils have an opportunity to think and to express their ideas (Black & William, 1998). It is the quality of feedback rather than its existence or absence that determines its power. Specifically, what makes the difference is the use of descriptive, criterion-based feedback as opposed to numerical scoring or letter grades (Frohbieter, Greenwald, & Stecher, 2011).

Senge described feedback and dialogue as a "broad concept" (1990, p. 281). This meant any reciprocal flow of influence of learning. Senge proposed dialogue as an

indicator of a broader view of a problem or situation. His research of inquiry skills stated these skills to be essential to solving a problem or situation. He stated useful feedback from the teacher or peers is much more important for learning than is maximizing the reliability of summative evaluations (Senge, 1990).

Research, *Inside the Black Box*, therefore shows the teacher's role in formative assessments is not simply to use feedback to promote content learning but also to help students understand the goal being aimed for, assist them to develop the skills to make judgments about their learning in relation to the standard, and establish a repertoire of operational strategies to regulate their own learning. Feedback to any pupil should be about the particular qualities of his/her work with advice on what he or she can do to improve, avoiding comparisons with other pupils (Black &Wiliam, 1998). Therefore, formative assessment is concerned with how judgments about the quality of student responses (performances, pieces, or works) can be used to shape and improve the student's competence by short circuiting the randomness and inefficiency of trial and error learning.

The cycle of feedback requires excellent teachers who are thinking, reflective, enthusiastic, passionate, and knowledgeable about their content. These teachers are encouraged to care to make the difference in student achievement and to care about their subject matter. Excellent teachers encourage students to share in seeking answers to three basic feedback questions: (a) Where am I going? (b) How am I going? (c) Where to next? (Hattie, 2003).

Cultural Change

Schein (2013) defined culture as a pattern of shared basic assumptions learned by a group as it solved its problems of external adaptation and internal integration. Schein (2013) developed cultures basically from three sources, beliefs, values, and assumptions, with beliefs being the most important because it refers to the responsibility of the leader. He also stated, "The only thing of real importance that leaders do is to create and manage culture" (Schein, 2010, p. 1). Culture is a hot topic but remains a tremendous opportunity for most organizations to further support their purpose, solve problems, and improve performance. Schein understood that a new environment and culture before change or observation must be made (Schein, 2010).

If educators have learned anything in the educational standards movement in the last decade, it is that policy changes without cultural change is an exercise in futility and frustration. Culture is reflected in the behavior, attitudes, and beliefs of individuals and groups. The single greatest impediment to meaningful cultural change is the gap between what leaders say that they value and what leaders actually value (Reeves, 2009).

Students frequently acquire bad habits and self-defeating attitudes as a result of the classroom culture. Black and Wiliam (1998) described this classroom culture as one that focuses on rewards, gold stars, grades, or class ranking, thus, encouraging pupils to look for ways to obtain the best marks rather than to improve their learning One consequence is that when students have a choice, they avoid difficult tasks—many become reluctant to ask questions out of a fear of failure. Black and Wiliam believed pupils who encounter difficulties are led to withdraw from learning. Educators avoid investing effort in learning that can only lead to disappointment, and they try to build

self-esteem in other ways. Taking steps to make change happen is the challenge facing teachers and educational leaders. Greenstein (2010a) stated that probably the most important and the most difficult job of an instructional leader is to change prevailing culture of a school. The requirements for cultural change are high-quality curriculum, high-quality assessment information about student learning, and teachers working together to innovate and improve teaching practices. This will then mean change in students' assessment practices and policies that affect meaningful change in their academic achievement.

Jacobs (2010) stated changing our mental models about what we teach, how we teach it, and how we assess students' learning growth will take time to enact. Such changes require open mindedness, flexibility, patience, and courage. Peter Senge described mental models as an important component of a learning organization. He stated the discipline of mental models starts with turning the mirror inward, the ability to carry on learningful conversations that balance inquiry and advocacy, where people expose their own thinking effectively and make that thinking open to the influence of others. Changing assessment processes is about changing minds first and then forming some new habits and routines as old ones are abandoned. Consider the following comments heard from school leaders about the nature of change: "We can't change the grading system – it's part of our culture, Public displays of data won't work here – the culture won't allow it. Culture comes with a new innovation" (Reeves, 2011, p. 36).

Cultural change, in education, begins with the formative assessment process to make a wholesale, teacher-led change in the learning atmosphere of a classroom, shifting that atmosphere from a traditional, often competitive orientation to a more learning-for-

all orientation. From a sociocultural perspective, formative assessment takes into account the role of interaction and joint collective action in the learning process (Heritage, 2010). Such a shift in classroom climate typically results from three significant changes: (a) A change in learning expectations. The teacher and the students see substantial learning as likely for all students, irrespective of how smart any student happens to be. (b) A change in the locus of responsibility for learning. It is no longer assumed that the teacher is overwhelmingly responsible for students' learning. Students bear significant responsibility for their own learning and the learning of their classmates. (c) A change in the role of classroom assessment. Classroom tests are no longer viewed as the means to make grade-determining comparisons among students or to motivate students to study harder. The vast majority of classroom tests are not graded at all (Popham, 2008, p. 3).

In the context of school change, culture might be defined as simply the "way we do things around here" (Reeves, 2011, p. 37). Reeves stated that one of his secrets was that profound change is the willingness of leaders to do unglamorous work. The role of organizational change is typically to communicate the essential message of change. Reeves also stated that when students receive feedback that is accurate, specific, and timely, the impact on achievement is so great that it is more significant than the socioeconomic status of children. This certainly is not an argument that poverty and other socioeconomic factors are unimportant. Instead, it is a declaration that the decisions that are made about critical instructional matters, such as feedback, can have a greater impact on student achievement than socioeconomic factors.

In addition to maintaining a classroom culture of success and providing students with constructive feedback, there are other techniques that teachers can employ to make

formative assessment work. Veteran teachers will not be surprised that these methods have been around awhile; nevertheless, these methods deserve to be observed: communicating purposes and learning targets of formative assessments, questioning, employing self-assessment and peer assessment, and using summative tests formatively. From a sociocultural perspective, formative assessment takes into account the role of interaction and joint collective action in the learning process. Assessment is not unidirectional but rather involves both teachers and students in reciprocal activity to move learning forward within a community of practice. This reciprocal activity is characterized by teachers and students engaged together in responding to evidence about learning, minute by minute, day by day. Learning takes place in a community of practice (Heritage, 2010).

In recent years, recommendations for including high-quality formative assessment as an integral part of a larger and more balanced assessment system have come from many groups and organizations, among them the Joint Committee on Standards for Educational Evaluation and the National Council on Measurement in Education Content. Additionally, level-specific organizations, such as the National Council of Teachers of Mathematics and the National Science Teachers Association, have also endorsed formative assessment as a way to advance learning and changing the educational culture for student learning (Heritage, 2010).

Formative assessment is an intentional learning process that involves teachers and their students in an active partnership focused on improving achievement and generating motivation to learn. Formative assessments help identify what students can do with help and what they can do independently Finally, it is not the instrument that is formative; it is

the use of the information gathered, by whatever means, to adjust teaching and learning d our mental models about what is taught, how it is taught, and how students' learning growth is assessed will take time to enact. It will take a change in the teachers' culture of how they do things to promote learning. Cultural change, in education, begins with the formative assessment process shifting the atmosphere from a traditional to a more learning-for-all orientation (Heritage, 2010).

Professional Development for Formative Assessments

Professional development is crucial in guiding teachers in the process of gathering data before, during, and after instruction and to subsequently use this data in forming decisions about teaching. Data from formative assessments can aid in making decisions about curricular changes and changes in instruction. Formative assessment and a balanced system when working effectively together improve each student's learning. Findings from literature in educational measurement, motivational psychology, and learning theory find formative assessment has an extensive research base that draws on both cognitive and motivational research. A review provided by Crooks (1988) at the University of Otago in New Zealand brought together findings from literature pertaining to several professional fields including educational measurement, motivational psychology, learning theory (both behaviorist and cognitive), and research on teaching that at that time rarely acknowledged one another. Crooks believed greater learning occurred when assessments focused on deep learning rather than surface or memorization approaches to learning (Shepherd, 2005). Another theoretical approach to formative assessment has been proposed in the area of didactics. This approach analyzes assessment as part of a triadic system linking the teacher, the learner, and the knowledge

being dealt with. Emphasis is placed on how the content structures of school disciplines determine the aims, means, and functions of formative assessment (Allah & Lopez, 2005). The professional Learning Forward organization states three reasons why professional learning matters: (a) A teacher's professional learning journey is an ongoing process throughout their teaching career. (b) The classroom is continuously changing, and teachers must be prepared to meet needs of their students. (c) It is important for school districts to adopt rich professional learning opportunities for its teachers. Therefore, the process of professional learning should provide teachers the opportunity to expand their skills of formative assessments, develop new formative assessment teaching strategies, and deepen their understanding of the implementation of formative assessments and how students learn.

Teachers need professional development because the job of teaching is so difficult, so complex, that one lifetime is not enough to master it (Wiliam, 2011b). Professional development begins with the end in mind or backward planning. The order of steps, according to Guskey (2014), for professional development are as follows: (a) Student learning outcomes should be considered first. (b) New practices to be implemented would be evaluated second. (c) Needed organizational support provided and in place. (d) Desired educator knowledge and skills verified. (e) Optimal professional learning activities implemented. High-quality professional development, Guskey stated, is the foundation on which any improvement effort in education must build. But to be successful educators must begin with the end in mind by planning backward, beginning with the student learning outcomes the educator wants to affect. Success in the end will depend on the beginning (Guskey, 2002).

In another study by Guskey (1994), *Results-Oriented Professional Development*, he offerd six guidelines to the success of any professional development. These six were development that is to change as both an individual and organizational process; think big, but start small: work in teams to maintain support; include procedures for feedback on results; provide follow-up, support, and pressure; and integrate programs. The problem in trying to identify the critical elements of successful professional development is that most efforts focus on a search for one right answer (Guskey, 1994).

Another important process is teacher change (Guskey, 2002). Professional development activities frequently are designed to initiate change in teachers' attitudes, beliefs, and perceptions. Professional development presumes that changes in teachers' attitudes and beliefs will lead to specific changes in their classroom behaviors and practices, which in turn, will result in improved student learning. But as important as these procedures are, they seldom change attitudes significantly or elicit strong commitment from teachers (Guskey, 2002).

A potential area for teacher professional development, one that has received much publicity in recent years, is concerned with applying what educators are learning about the brain to the design of effective teaching. Cognitive psychologists work to understand what the brain does and how the brain does what it does, while neuroscientists try to connect what the brain does to its physiology (Wiliam, 2011a). Some of the earliest attempts to relate brain physiology to educational matters were related to the respective roles of the left and right sides of the brain in education and training. Conclusions drawn in this area were unwarranted.

Furthermore, elements of formative assessment support the brain in making connections by linking prior knowledge to new learning, putting together parts and wholes, and providing opportunities to process information in different ways (Black & Wiliam, 1998). The elements of formative assessment are very clear, simple, and easy to learn and involve the following: include the practice in the classroom, stress that teaching and learning are interconnected; set expectations for classroom practice; provide exemplars, role models, and mentors at all levels; encourage teacher collaboration to include information about formative assessments; discuss supportive values, beliefs, actions, and structures; and assess results of learning in a balanced and transparent manner (Heritage, 2010).

Stressing the importance of balancing cognitive and affective elements in instruction cannot be overstated. Educators need to be trained in gathering data before, during, and after instruction and need to use this data to form decisions about teaching. Data from formative assessments can help in making decisions about curricular changes and changes in instruction. Educators should remember that formative assessment and a balanced system address the goal of improving each student's learning (Doty, 2008).

Wiliam (2011) believes there is evidence that teachers in countries that are more successful than the United States in international comparisons appear to have stronger knowledge of the subjects they are teaching and this, in part, appears to be responsible for a widespread belief that teacher professional development needs to be focused on teachers' knowledge of the subject matter they are teaching. Wiliam also credited summer professional development workshops for increasing teachers' knowledge of their

subjects. Students learn more with more knowledgeable teachers, although the effects are small.

Trumbull and Gerzon (2013) considered teacher quality as one of the strongest predictors of student learning and teacher professional development is one factor affecting teacher quality. Trumbull and Gerzon argued that because research has shown that formative assessment contributes to student learning, there is reason to believe that professional development on formative assessment has the potential to enhance student achievement. District leaders and teachers need to know that when they begin professional development on formative assessment, they will be in it for the long haul because formative assessment practice requires teachers to think differently about the relationship between instruction and assessment, to see feedback as a central mechanism in promoting learning, and to come to regard student as partners in the learning process. Such fundamental shifts in practice take time, commitment, and patience on the part of both teachers and administrators.

Professional development works, according to Trumbull and Gerzon (2013), by (a) improving teachers' knowledge, skills, attitudes, and beliefs; (b) improving instruction; and (c) improving student learning. Guskey (1994) differed with this statement. His research, *Results-Oriented Professional Development*, found it rare to find a professional development effort of this day that was designed and implemented with effects on student learning. He believed the key to greater success in professional development rests not so much in the discovery of new knowledge, but in a teacher's capacity to use deliberately and wisely the knowledge they have (Guskey, 1994).

Summary

Formative assessment is not new. Though it may not have been called that by name, effective teachers have always probed, in the course of instruction, to understand students' thinking and learning. The research on formative assessment is compelling and shows educators explicitly how formative assessment works to improve learning – by helping students internalize the features of good work, by showing them specifically how to improve, by developing habits of thinking and a sense of competency, and so forth. The main point of all these arguments is that achievement of students would be raised only by changes that are put into direct effect by teachers and pupils in classrooms.

There is a body of firm evidence supporting that formative assessment is an essential feature of classroom work and that development of it can raise standards through its consistent use. Teachers can quickly gather data to determine whether students are mastering the goals and standards or if there are gaps in students' learning. Black and Wiliam knew of no other way of raising standards for which such a strong case could be made based on evidence of such large learning gains. To improve their performance, students need to know how they are progressing. Formative assessment feedback is commonly defined in terms of information given to the student about the quality of performance or knowledge of results.

Educators must continue to research formative assessment's effectiveness and identify best practices in using it. Most importantly, educators must remember that formative assessment and a balanced educational system aim to improve each student's learning. The transition from teacher-supplied feedback to learner self-monitoring is not something that comes about automatically. That is a change in culture of a school. As

noted in Schein, 2010, the most important and the most difficult job of an instructional leader is to change the prevailing culture of a school. The researcher also explained what is required for cultural change is high-quality curriculum, high-quality assessment information about student learning, and teachers working together to innovate and improve teaching practices. When change in assessment practices and policies can affect such meaningful change for students, how can educators not take up this challenge (Greenstein, 2010)?

CHAPTER THREE

METHODOLOGY

This descriptive, nonexperimental, quantitative dissertation studied teacher perceptions of formative assessments and the effect on academic growth in a rural setting. The survey instrument focused on kindergarten through high school teachers' perceptions of formative assessments and the effect on academic growth in a rural setting of the Department of Elementary and Secondary Education (DESE) region of Southwest Missouri. This region included districts ranging from 150 students to 44,000 students. The five different demographic questions disaggregated the study results: (a) How many years have you been in education? (b) What is your grade level? (c) How many students are in your school? (d) Is your school currently consistently implementing formative assessments; how long? (e) My current role is? The main goal was to determine perceptions of formative assessments by kindergarten through high school teachers and the effect of formative assessments on academic growth.

Participants

The attitudinal survey was given to all kindergarten through high school teachers in the Southwest Missouri DESE region. All teachers of five schools were invited to participate regardless of size or grade arrangement of these schools. Specifically, the survey was given to teachers in each school to determine the importance of formative assessments to improve student achievement and the frequency of integrating these into the daily instruction. Demographic information was collected to assist in separating grade levels and total building enrollment.

The survey, informed e-mail consent, ethics certificate, and Research Review Board (RRB) application were sent to the RRB electronically and as a paper copy with the appropriate signatures in April 2015 for approval. Participants gave consent to be involved in the study by completing the online survey. The submitted forms outlined participant confidentiality, the ability to withdraw at any time without penalty, lack of any foreseen harm to respondents, and a brief overview of the study's aim to provide a synopsis of the teacher perception regarding the formative assessments and student achievement of kindergarten through high school students.

Survey Rationale and Construction

The survey used in this study was composed of two scales: (a) the implementation of formative assessments and feedback and (b) the impact on student achievement and motivation for lifelong learning. The first scale, the implementation of formative assessments and feedback, came from the research pointing to helping a student be successful at or above their academic level. These were Survey Questions 1-14. For a student to grow academically, the educator needs to know exactly what the student can achieve. The educator must also understand that the student will only achieve the utmost academically when immediate feedback is provided. There are many methods of providing formative assessments, but the feedback must come from the teacher to provide an understanding of what the student can do and then stretch them to perform at a higher level. Formative assessments and feedback go hand in hand for the benefit of the student by filling in learning gaps. These assessments are used continually throughout the school year to identify student strengths and needs and are utilized to guide instruction and intervention. Formative assessments are a particular kind of measurement instrument to

gauge the development of learners. Although these interventions are not for grading they do help identify what students can do with help and what the students can do independently.

The second scale was also integral to the purpose behind this study to measure the impact on student achievement and lifelong learning. These were Survey Questions 15-26. Although teachers sometimes question their lack of influence in the process of formative assessment usage in the classroom, there is a great deal this assessment can do to influence in a profound way. The timely use of formative assessment feedback equates largely the improving of student achievement. The research on formative assessment is compelling and shows explicitly how formative assessment works to improve learning. Formative assessment results help students internalize the features of good work by showing them specifically how to improve, by developing habits of thinking and a sense of competency and the desire to be a life-long learner. The survey used a Likert-type scale.

Survey Development

Survey questions were created utilizing a number of resources. First, the researcher perused several surveys schools had posted on the Internet. These were useful for prompting brainstorming ideas for questions. In addition, knowledge and items gained from the continued literature review about formative assessments and feedback and the impact on student achievement and motivation for lifelong learning were utilized when crafting the survey. As noted in Table 1, questions were developed and aligned based on these insights.

Table 1: *Table of Specifications*

STATEMENTS	Implementation	Impact
1. Formative assessments should be embedded in daily teaching and learning.	X	
2. I believe in the positive effects of using formative assessments.	X	
3. I provide grades for formative assessments.	X	
4. I believe the implementation of formative assessments will improve my teaching.	X	
5. My school supports risk-taking by teachers.	X	
6. I implement formative assessments as ongoing assessments.	X	
7. Formative assessments have an impact in student achievement.	X	
8. There are positive effects on student learning when using formative assessments.		X
9. I believe learners need ongoing feedback.		X
10. I believe feedback is beneficial.		X
11. Consistent use of formative assessments is beneficial.		
12. Formative assessments need to be integrated within academics.		X
13. I believe the implementation of formative assessments will increase student learning.		X
14. I believe it is my responsibility to implement consistent formative assessments in my teaching.	X	
15. I believe formative assessments will increase student learning.	X	
16. I believe it is my responsibility to implement consistent. formative assessments in my teaching.	X	
17. I believe formative assessments will increase student learning.	X	
18. Formative assessments will increase the confidence in teaching skills of instruction.	X	
19. I use digital formative assessments.		X
20. I use a variety of formative assessments.	X	
21. Formative assessments are easily used in my content.		X
22. My school has reached consensus on clear and consistent academic expectations.		X
23. My school has conversations centered on formative assessments.		X
24. Recording grades from formative assessments should not be a part of student learning.		X
25. Teachers must encourage students to participate in developing learning goals.		X
26. Formative assessments require immediate feedback.	X	

Pilot Process

To increase reliability, the survey consisted of questions stated in the positive as well as reversed questions to ensure respondents were giving consistent responses as opposed to marking responses automatically. Drafts of the survey were submitted numerous times to the researcher's advisor, an expert in statistics, and, consequently, the survey was revised after each discussion. In addition, several pilot surveys were administered to experts in the educational field. The results of these pilot surveys were utilized to revise and improve the survey tool. The pilot process consisted of the following five steps:

1. Colleague Feedback—Doctoral cohort colleagues provided feedback in winter 2015 during the school year. The survey underwent considerable changes and additions were made to the survey based on the colleagues' feedback.
2. Index of Item Objective Congruence—The first version of the survey instrument as presented in Appendix A was used to garner feedback from experts in the field of formative assessments and survey instruments—two elementary principals, two elementary teachers, one instructional coach, and a university professor.
3. Validity Pilot—The next iteration of the survey was used as a pilot to educators. For this pilot, participants were elementary schools, middle school teachers, junior high teachers, and high school principals and teachers in Southwest Missouri rural schools. To present a cross-section of the study's

potential population, four districts were chosen with a variety of characteristics.

4. Revision of Statements—Many questions were rewritten for clarity and measure of reliability. Some questions were omitted because reliability was too low or they were not clearly written. See Appendix A for final version of the survey that resulted from Steps 2 and 3.
5. Cronbach's Alpha for Internal Consistency/Reliability – The check for reliability and consistency in answers was calculated through SPSS. With the goal of a Cronbach's Alpha figure of .70 or higher, the perceptions of the formative assessment implementation practice clearly met the criteria for being reliable enough to use in the final survey (alpha = .798). The same held true for the impact scale (alpha = .912).

Procedure

Once the pilot surveys were complete and necessary revisions made, the final version of the survey instrument was e-mailed to principals and teachers, by way of their administrators, in the participant schools within the Southwest Missouri region as outlined above in winter 2015. Principals were partitioned to forward the link to their respective teachers. E-mail addresses of elementary principals in Southwest Missouri were obtained through the department of DESE information system. The survey was left open for approximately three weeks. The RRB approved informed consent and explanation information presented in Appendix B were included in the original e-mail as well as the opening page of the online survey. Each potential participant had the option to recuse him/herself from taking the survey by declining the survey. To obtain a higher

return rate, principals were reminded two times via e-mail to take the survey as well as send it to their staff. A factor analysis was performed on the final results from the 31-question survey to determine validity and item load on the theorized scales. Table 2 shows the factor analysis values for the final survey results.

Table 2: *Table of Exploratory Factor analysis:*

STATEMENTS	Factor 1	Factor 2
1. Formative assessments should be embedded in daily teaching and learning.	.219	**.830**
2. I believe in the positive effects of using formative assessments.	.416	**.731**
3. I provide grades for formative assessments.	.216	**-.607**
4. I believe the implementation of formative assessments will improve my teaching.	.592	**.616**
5. My school supports risk-taking by teachers.	**.731**	-.277
6. I implement formative assessments as ongoing assessments.	.318	**.518**
7. Formative assessments have an impact in student achievement.	.549	**.734**
8. There are positive effects on student learning when using formative assessments.	**.702**	.600
9. I believe learners need on-going feedback.	**.781**	.385
10. I believe feedback is beneficial.	**.616**	.493
11. Consistent use of formative assessments is beneficial.	**.506**	.349
12. Formative assessments need to be integrated within academics.	**.702**	.600
13. I believe the implementation of formative assessments will increase student learning.	**.702**	.600
14. I believe it is my responsibility to implement consistent formative assessments in my teaching.	**.713**	.561
19. I believe formative assessments will increase student learning.	.549	**.734**
20. I believe it is my responsibility to implement consistent formative assessments in my teaching.	**.713**	.561
21. I believe formative assessments will increase student learning.	.549	**.734**
22. Formative assessments will increase the confidence in teaching skills of instruction.	**.598**	.574
19. I use digital formative assessments.	**.713**	-.171
20. I use a variety of formative assessments.	**.716**	.016
21. Formative assessments are easily used in my content.	-.151	**.657**
22. My school has reached consensus on clear and consistent academic expectations.	.265	-.007
23. My school has conversations centered on formative assessments.	.608	.196
24. Recording grades from formative assessments should not be a part of student learning.	.002	**.887**
25. Teachers must encourage students to participate in developing learning goals.	**.769**	.152

The overall statistics are reported in Table 3. The implementation factor analysis was reported by Cronbach's Alpha and compared to the pilot survey results, which was .798. The impact factor analysis was reported by Cronbach's Alpha and compared to the pilot survey results, which was .912. The factor analysis revealed a possible concern of both components resulting in the same idea rather than distinct ideas. The second concern was 97 respondents completing the survey resulting in the problem of not having to face not enough participants.

Table 3: *Table of Confirmatory Factor analysis*

STATEMENTS	Factor 1	Factor 2
1. Formative assessments embedded in daily teaching and learning.	**.530**	.050
2. I believe in the positive effects of using formative assessments.	-.065	**.662**
3. Grades are not necessary for formative assessments.	**.469**	-.361
4. I believe the implementation of formative assessments will improve my teaching.	**.620**	-.046
5. I implement formative assessments as on-going assessments.	**.761**	.253
6. Formative assessments have an impact in student achievement.	**.896**	.107
7. There are positive effects on student learning when using formative assessments.	**.278**	**.706**
8. I believe learners need on-going feedback.	**.692**	.380
9. I believe feedback is beneficial.	**.621**	.293
10. Consistent use of formative assessments is beneficial.	**.816**	.169
11. Formative assessments need to be integrated within academics.	**.886**	.061
12. I believe the implementation of formative assessments will increase student learning.	**.664**	-.018
13. I believe it is my responsibility to implement consistent formative assessments in my teaching.	**.648**	-.134
14. I believe formative assessments will increase student learning.	**.883**	.008
15. I believe it is my responsibility to implement consistent formative assessments in my teaching	**.799**	.036
16. I believe formative assessments will increase student learning.	**.743**	-.039
17. Formative assessments will increase the confidence in teaching skills of instruction.	**.875**	-.028
18. I use digital formative assessments.	**.900**	.034
19. I use a variety of formative assessments.	**.787**	.004
20. Formative assessments are easily used in my content.	.027	**.762**
21. Recording grades from formative assessments should not be a part of student learning.	.002	**.887**
22. Teachers must encourage students to participate in developing learning goals.	.254	.081
23. Formative assessments require immediate feedback.	**.653**	.160

A concern was identified with Question 23. It was not clear with which construct the idea aligned. The decision was made to eliminate this question from the final data analysis.

Reliability

Table 4 shows Cronbach's Alpha on the first set of statistics, Implementation of Formative Assessments. Previously, in the pilot survey, Implementation was .798. Three items were reduced after the pilot survey. A significant increase was noted after the changes made in the final survey.

Table 4: Cronbach's Alpha of Implementation of Formative Assessments

Cronbach's Alpha	*N* of items
.807	10

This indicated a consistency in the surveys. The survey results indicate the same idea rather than two distinct ideas. Overall, the data revealed both the Impact on Student Achievement and the Implementation were favorable and consistent.

Table 5 shows Cronbach's Alpha on the second set of statistics, Impact on Student Achievement. Previously, in the pilot survey, this was .912. Three items were reduced after the pilot survey. These statistics indicated a consistency in the survey.

Table 5`: Cronbach's Alpha of Impact on Student Achievement

Cronbach's Alpha	N of items
.888	10

Quantitative Data

The final survey was completed by 97 participants, including three administrators. The overall impact of implementing formative assessments was indicated by the number of years an educator had taught and the number of students that teacher had. However, others (coaches, music, art teachers and paras) were more favorable than teachers on the consistency of implementing formative assessments. Face validity was satisfactory and content validity was satisfactory. Construct validity, especially of the pilot survey, showed promise and changes were made to the final survey. The decision was made to maintain two sections of the survey based on the previous validity measures and the need for further testing on a larger pool of participants.

Conclusion

A large element of this study was the development of the survey instrument to gauge the implementation of formative assessments and feedback and the impact on student achievement and motivation for lifelong learning. Along with the development of a quality survey instrument, the results of this study will provide data for school and state leaders to discuss in Southwest Missouri. An analysis of the open-ended question responses was performed to determine if there was information worth sharing in the study. Teacher interviews were performed to grasp a firmer view of implementation and the impact of implementing formative assessments. Themes and ideas that consistently surfaced are addressed in Chapter Four. The quantitative nature of this study was held except for quality substantial information from the comments in the study.

After analysis of the pilot survey data, it was determined to delete three questions because of repetition of question format. It was also determined to rewrite four questions

for clarity of the instrument. Concern for survey reliability of the instrument stemmed from the limitation of participants. Fifty participants completed the pilot survey.

After the pilot survey was rewritten, it was distributed to Southwest Missouri school districts. Ninety-seven participants from five districts completed the final survey. The results of the final survey are in Chapter Four, Analysis of Data.

CHAPTER FOUR

ANALYSIS OF DATA

Introduction

The purpose of this study was to investigate the results of implementing formative assessments, and the impact it has on student achievement in the classroom setting. Research finds formative assessments to be a process, not a particular test, which motivates students to increase achievement in the classroom (Popham, 2012). Researchers Black and Wiliam (2011) revealed that student gains impacted by formative assessment practices were among the largest ever reported for educational interventions. Chappuis and Chappuis (2007) stated, "The greatest value in formative assessment lies in teachers and students making use of formative assessment results to improve real-time teaching and learning at every turn" (p. 14). This research study was designed to further pursue the impact and results of implementing formative assessments in the classroom today.

The framework for the analysis of data was centered on the research questions for the study:

1. What are the perceptions of teachers regarding the implementation of formative assessments?
2. What are the perceptions of teachers regarding the impact on student achievement through the use of formative assessments?
3. What are the differences of perceptions based on:
    a. years as an educator;
    b. grade level taught;

c. size of the school;

d. school-wide use of formative assessments?

To ascertain answers to these questions, data analysis primarily focused on quantitative analysis based on a perceptual survey developed by the researcher. To provide supplemental insights to the quantitative analysis, teacher interviews were conducted.

A survey was developed and analyzed to measure two distinct concepts regarding the perceptions of teachers about formative assessments. The first scale, the implementation of formative assessments and feedback, measured teacher perceptions about the use of formative assessments to help students be successful at their academic level. The second scale was also integral to the purpose behind this study, to determine the impact that formative assessments have on student achievement and student motivation for lifelong learning. The survey results were first analyzed holistically to depict the overall nature of the two components. With the intention of analyzing the research questions in this study, two variables were identified: implementation of formative assessments and impact on student achievement. Both descriptive and inferential statistics were utilized to analyze the data and will be presented in this chapter to give insight into answers to the research questions used in this study.

Finally, teacher interviews were conducted in order to present a broader view of teacher perceptions of formative assessments, the frequency of implementing, and the impact of formative assessments in the classroom. The data from the survey were analyzed descriptively to provide an overall picture of teachers and their perspectives related to each scale. The data were analyzed inferentially to determine if any differences existed in the perceptions of the teachers. The information gained from the teacher

interviews provided supplemental insight and nuances about the results from the quantitative analysis.

Descriptive Statistics

Table 6: Means, Ranges, and Standard Deviations for Scales

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Implementation	97	14.00	22.00	36.00	29.19	3.49
Impact	91	18.00	26.00	44.00	36.90	4.85

Table 6 shows the means, ranges, and standard deviations for the two scales on this survey instrument. The figures for descriptive statistics were based upon the first 10 questions in the implementation scale and 13 questions in the impact scale as determined by the factor analysis. Values and explanations were presented in Chapter Three to how each scale was finalized. The exploratory and confirmatory factor analysis confirmed the alignment of the survey questions with the theorized scales. Any questions that were not aligned with one of the theorized concepts were not used in the analysis. Survey items from the first scale were related to the first scale, the implementation of formative assessments and feedback, and came from research that strongly suggested formative assessments help students be successful at or above their academic level. The second scale included survey items that involved a second integral purpose behind this study, discovering the impact formative assessments have on student achievement and lifelong learning. This scale revealed perceptions about how assessment can influence student achievement.

Implementation perceptions

The descriptive data revealed overall perceptions of teachers about the implementation of formative assessments in their classrooms. The lowest possible value for this scale was 10 and the highest possible value was 40. The mean of the Implementation Scale was 29.19. The range of implementation was 14 and the standard deviation indicated the spread of 3.49 (see Table 6). This indicated that overall, teachers in this study were fairly favorable to the implementation of formative assessments in their classrooms. Additionally, the teachers surveyed were consistent in the belief that formative assessments would increase student academic motivation and achievement. The teachers in this study reported agreement with the need to use formative assessments within their classroom instruction.

Impact Perceptions

The descriptive data revealed overall perceptions of teachers about the impact of formative assessments in their classrooms. The lowest possible value for this scale was 10 and the highest possible value was 40. The mean of the Impact Scale was 36.90. The range of impact was 18 and the standard deviation indicated the spread of 4.85 (see Table 6). This indicated that overall, the teachers surveyed in this study were favorable to the impact of formative assessments in their classrooms to increase in academic achievement. The results of impact indicated the timely use of a formative assessment and a teacher's immediate feedback was viewed as making a difference in the improvement of student achievement.

Inferential Statistics

The first scale, the implementation of formative assessments and feedback, came from the research findings that suggested the use of formative assessments helps students be successful at their academic level. The second scale was also integral to the purpose behind this study to determine the impact that formative assessments have on student achievement and student motivation for lifelong learning (Marzarno, 2009).

For each scale, the data were analyzed for differences (*t* tests and Anova's) in the following ways: years of service, grade level, number of students, current implementation status, and role in education. These attributes were represented in Questions 27-31 on the survey. See Table 7.

Implementation Scale Inferential Analysis

Table 7: ANOVA: Implementation of Formative Assessments – Status

	Sum of Squares	*df*	Mean Square	*F*	Sig.
Implementation Between groups	86.41	2	43.21	2.86	.06
Within groups	1389.55	92	15.10		
Total	1475.96	94			

On the implementation scale, no significant differences were found based on years of service, grade level, number of students, and role in education. However, with regard to the implementation status, a significant result for implementation was noted, $p \leq .1$. Teachers who were implementing formative assessments for three or more years were found to be more favorable about implementation than teachers not currently implementing formative assessments.

Due to the limited number of responses, additional research included surveying additional schools in order to verify the statistical results. Therefore, teacher interviews

were conducted to further understand the implementation of formative assessments for teachers.

Impact Scale Inferential Analysis

Table 8: ANOVA: Impact on Student Achievement Grade

		Sum of Squares	*df*	Mean Square	F	*Sig.*
Impact	Between Groups	30.37	2	15.18	.68	.5
	Within Groups	1929.74	87	22.18		
	Total	1960.10	89			

On the impact scale, no significant differences were found based on years of service, number of students, and current implementation status. In regard to grade level taught, the significant result for impact was $p < .05$ (See Table 8). A post hoc test, Tukey's HSD, was conducted to ascertain between which groups the difference(s) existed. The difference was noted between Grade 4-8 teachers and Grades K-3 teachers. Teachers in grades 4-8 were more favorable about the impact on student achievement of formative assessments than teachers in Grades K-3.

With regard to teachers vs *others*, a difference was found regarding impact on student achievement. *Others* could be identified as certified teachers in aide positions, coaches not in classroom positions, or specials teachers not in content areas. When the *t* test was calculated, $t\ (88) = 4.975$, $p \leq .05$, it was evident that *others* had a more positive perception of the impact formative assessments have when implementing them than regular classroom teachers.

Due to the limited number of survey responses, it was not possible to determine if other differences existed. However, the data analysis indicated the potential of additional differences, so further testing was deemed necessary to confirm. Teacher interviews were

conducted to provide supplemental insight about perceptions in addition to the information gathered from the quantitative analysis.

Teacher Interviews

Teacher interviews were conducted after the final teacher survey was administrated and analyzed. One individual from each school district surveyed was invited by the researcher to be interviewed. It was determined to have a representative from each district surveyed in order to enhance the breadth of data. There were five interviewees responding to the interview request and all teachers had taught more than three years. These teachers represented a variety of grade levels: elementary, middle school, junior high, and high school. Each teacher was interviewed individually and was asked the same six questions (see Appendix B) and follow-up questions were asked to provide more detailed answers about the key ideas in the questions. Questions were constructed based on key concepts noted in the literature. Comments were recorded and analyzed with the framework advanced by Bogden and Biklen (2007). Bogdan and Bilken suggested examining the interviewees' perspectives and ways of thinking about people, processes, activities, and relationships. Themes that resonated back to this research of formative assessment and which were reflected in the survey results emerged. Themes included professional development, academic culture, and academic progress of students. Comments were organized around the themes that emerged.

The researcher kept field notes as to how many teachers answered the same question favorably and teacher comments. The interview responses led to the follow-up questions to ascertain deeper information from the respondents in order to acquire a more

comprehensive view of formative assessments and teachers' individual views. Probing questions referring to professional development were included (see Appendix C).

Professional development

The lack of training was a common perception held by the five teachers. Whether it was little or no professional development, all of the interviewees indicated a need for additional training and practice. These teachers were nervous concerning formative assessments and were insistent about the need to seek professional development. All teachers interviewed referenced the need for professional development about formative assessments in the context of an integrative method of supporting education and classroom instruction intervention. One interviewee in particular commented on being unaccustomed to facilitating formative assessments because of lack of training and the need for professional development in this area. All of the interviewed teachers commented that they would benefit from professional development in the use of formative assessments in the classroom and would engage in the training.

Academic culture

A common thread among the five teachers interviewed was the belief that formative assessments supported teacher instruction. All teachers agreed that the use of formative assessments was an excellent gauge in the facilitation of content instruction. Two teachers expressed the value of formative assessments was in the versatility in instruction and the positive change in the learning environment. All of the interviewed teachers agreed that formative assessments were useful at any time during a lesson and could provide an understanding of the knowledge students held.

Two of the teachers indicated they were not intimidated to use formative assessments in the classroom, and believed they were fully aware of how to monitor student progress with formative assessments. Three of the five teachers interviewed were not as experienced with the process of implementing formative assessments. These teachers were currently training in the implementation process and the creation of formative assessments. Teachers' perceptions indicated that if they were consistently mentored by more experienced teachers this would become routine with practice.

Academic progress of students

Perceptions were positive from teachers about the recognizable impact of implementing formative assessments and the degree of motivation students experienced after formative assessments and feedback. Two respondents believed that rigorous formative assessments revealed extensive information about the knowledge of the students at that point in time, but also acknowledged that formative assessments could present a challenge to prepare. All teachers interviewed stated that they did see an improvement in student achievement in a very positive way. However, being held accountable for giving effective feedback was noted as an area of weakness for three of the teachers interviewed. Two teachers had the perception that feedback from formative assessments was very important to them in order to move the students forward in their content area and to challenge students to go deeper in the content. Three teachers commented that they were somewhat inexperienced in implementing formative assessments and would benefit from student feedback but had not experienced providing feedback. These teachers indicated a hesitancy of not only asking questions or making comments, but also struggled in their ability to prompt students to pursue content

information independently and more in depth. Teachers did, however, comment they were always interested in increasing student achievement and motivation in student learning. Perceptions of teachers included they were eager to utilize formative assessments in advancing student achievement. The teachers commented that this was an educational investment worth spending time developing if it would enhance student achievement and motivation in learning.

Summary

The data from the survey revealed that teachers were favorable about the implementation of formative assessments in the classroom and the impact of formative assessments in promoting student learning. There were two factors that showed a significant difference in the perceptions of teachers on these two concepts. The main differences in the final data analysis occurred in the grade level taught and the number of years taught. Data indicated that teachers in Grades 4-8 were more favorable about the impact of formative assessments on student learning than teachers in Grades K-3. Those teachers implementing formative assessments for three or more years were more favorable than those not currently implementing formative assessments.

Based on the number of respondents and the final analysis of data, it was determined that qualitative data would be useful to provide supplemental insight. The concern was only 97 participants completed the final survey and that not all differences may have been noted. Consideration was given to five teacher interviews. Comments were analyzed to bring to light teacher insights regarding how professional development related to formative assessments, how academic culture related to formative assessments, and how the academic progress of students was impacted through the use of formative

assessments. Chapter Five summarizes the review of literature, research, procedure of survey, analysis of data, findings, and recommendations.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

Introduction

The purpose of this study was to gauge the perceptions of teachers in Southwest Missouri regarding the implementation of formative assessments and the impact these assessments have on student achievement. Results from this study will inform administrators about the nature of the perceptions of teachers regarding formative assessments and provide recommendations for instructional direction when using formative assessments. Additionally, a valid and reliable survey was developed that administrators can use with teachers regarding their perceptions of formative assessments. Guiding the overall focus of the study were the following research questions:

1. What are the perceptions of teachers regarding the implementation of formative assessments?
2. What are the perceptions of teachers regarding the impact on student achievement?
3. What are the differences of perceptions based on
    a. years as an educator;
    b. grade level taught;
    c. size of the school; and
    d. school-wide use of formative assessments?

An analysis of the survey results led to a description of the perceptions held by participating respondents regarding implementing formative assessments and the impact these formative assessments had on student achievement. The survey also contained five demographic questions to identify years of service, grade level taught, number of students, current implementation status, and role in education. Due to the limited number of respondents to the survey, teacher interviews were conducted to provide supplemental insights about teacher perceptions regarding formative assessments. Field comments were recorded, and themes were identified and referenced to the questions in this study. Teachers participating in interviews were representative of the five districts involved in the survey (see Appendix D).

Resulting data revealed insights about the perceptions of teachers in the study. The first scale, the implementation of formative assessments and feedback, measured teacher perceptions about the use of formative assessments to help students be successful at their academic level. The second scale examined the perceptions of teachers about the impact that formative assessments have on student achievement. These two components were viewed by the teachers as favorable and the teachers were fairly consistent in this belief.

Interview questions were asked of teachers in all five districts surveyed. The major concern of all teachers was the lack of training available through their district. All recognized the importance of implementing formative assessments, as well as the impact of formative assessments in the classroom environment. Most teachers interviewed recognized the value of implementing formative assessments, but they found it

challenging to create them. Teacher comments were included in the interviews and field notes recorded.

Conclusions

The heart of effective formative assessment processes is changing the relationship between teachers and students, and managing the multitude of these interactions and relationships. The goal of formative assessment is to assess the development of all learners toward proficiency. The potential benefit of formative assessments is the impact on student learning.

Black and Wiliam (1998) noted formative assessments are not an instrument or an event, but a collection of practices with a common feature that lead to action that improves learning. Heritage (2010) supported this research by categorizing the four essential elements for the formative assessment process: "1) identification of the learning gap; 2) feedback; 3) student involvement; and 4) progression of learning" (p. 4). The review of literature guided the construction of the survey and the decision for revisions. Consequently, the survey brought to light the importance of feedback in the formative assessment process and the need for professional development to build confidence in educators implementing formative assessments.

Findings from the survey analysis indicated teacher perceptions for teachers of Grades 4-8 were more favorable to the implementation and impact of formative assessments than teachers for Grades K-3. Teacher perceptions also indicated that younger teachers needed support and an experienced mentor in order to be successful implementing formative assessments and observing the impact of this practice. The size of the school and grade level taught made no difference with teacher perceptions,

however there was a difference in teacher perceptions of school-wide implementation and impact of formative assessments. Additional support for these findings was gained from the interview data collected. These teachers indicated they would benefit from more professional development related to formative assessment. They also noted that formative assessments should be used to gauge student content understanding and to guide instruction, and used as a valuable feedback tool, which may also serve as a motivation to children. However, those interviewed indicated there may be a need to hold teachers accountable for providing this feedback. These conclusions provided key suggestions for current educators as they continually look for ways to improve their instructional practice.

Professional Implications

There are implications that this study has on future research, as well as the field of education in general. Teachers (especially in upper elementary) had positive perceptions about the implementation of formative assessments in the classroom and about the impact that formative assessments can have on student learning; therefore, administrators can build upon the foundation of these perceptions. Data revealed that teachers recognized the need for professional development related to the use of formative assessments, that teachers recognized the use of formative assessments in the classroom to impact the academic culture, and that teachers understood the academic progress for students resulting from the use of formative assessments. This insight can guide administrators by targeting identified needs of teachers about formative assessments that extend beyond just the potential benefits. It is suggested that administrators hold teachers accountable for using formative assessments and remind them of the potential student motivation

aspect of using these tools. This is consistent with the notions of Black and Wiliam (1998) and Popham (2012) that the practice of implementation and impact of formative assessments must be ongoing practice in order to be successful in the classroom.

Recommendations for Further Research

Building on this study, the next phase of research could include surveying a larger pool of educators and additional districts. The review of literature in this study highlighted the importance of implementing formative assessments in order to monitor student learning and the need to alter teacher strategies. Research also indicated that successful implementation of formative assessments is needed to motivate students and increase student achievement. Consequently, a future study may look at a comparison of student data before and after the formative assessment process.

Additional interview questions include these questions: If you are a team teacher, do both of you implement formative assessments? Has the implementation of formative assessments become a habit in your daily routine? Are you willing to mentor other teachers in the process of implementing formative assessments? Any of these questions could be spurs to take from and add to this original study.

The importance of professional development was integral to this research and the success of implementation and impact of formative assessments. Guskey (2002) stated high-quality professional development is the foundation on which any improvement effort in education must build. But, to be successful educators, formative assessments must begin with the end in mind by planning backward, beginning with student learning outcomes the educator wants to affect. It is suggested that future research be conducted to

identify best professional development practices for instilling high-quality formative assessment development and implementation.

Summary

Formative assessment are not a test, nor an instrument, but rather an approach to teaching and learning that uses feedback as its centerpiece in a supportive classroom environment. Teachers' perceptions revealed formative assessment to be a practice that empowers teachers and students to give their best to enable learning. In the end, the success of formative assessment as a facilitator of learning depends on the knowledge and skills of teachers to implement this approach in collaboration with their students. The survey instrument from this study was tested and found to be valid and reliable, making it ready to be utilized at a building, district, or state level to determine whether a culture to support the implementation of formative assessments and feedback is feasible.

Teachers revealed it is a best practice to implement formative assessments with the goal of reaching high levels of student achievement and motivation to learn. Studying formative assessments, feedback, and effective implementation processes to support formative assessments adds to what teachers know about good teaching and learning. Professional development is needed to make this possible. Teacher mentors, also, are a support to teachers integrating formative assessments in instruction.

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Appendix A: Survey Instrument (final version)

(1) Strongly Agree, (2) Agree, (3) Disagree, or (4) Strongly Disagree

1. Formative assessments are easily used in my content.
2. Recording grades from formative assessments should not be a part of student learning.
3. Teachers must encourage students to participate in developing learning goals.
4. Formative assessments require immediate feedback.
5. Formative assessments should be embedded in daily teaching and learning.
6. I believe in the positive effects of using formative assessments.
7. Grades are not always necessary for formative assessments.
8. I believe the implementation of formative assessments will improve my teaching.
9. I implement formative assessments as ongoing assessments.
10. Formative assessments have an impact in student achievement.
11. There are positive effects on student learning when using formative assessments.
12. I believe learners need ongoing feedback.
13. I believe feedback is beneficial.
14. Consistent use of formative assessments is beneficial.
15. Formative assessments need to be integrated within academics.
16. I believe the implementation of formative assessments will increase student learning.
17. I believe it is my responsibility to consistently implement formative assessments in my teaching.
18. I believe formative assessments will increase student learning.

19. Formative assessments will increase the confidence in teaching skills of instruction.
20. Recording grades from formative assessments should not be a part of student learning.
21. I use digital formative assessments.
22. I use a variety of formative assessments.

Demographics:

1. How many years have you been a teacher?
   a. 1-5
   b. 6-10
   c. 11-15

2. What is your grade level?
   a. k-3
   b. 4-8
   c. 9-12

3. How many students are in your building?
   a. Less than 200
   b. 200-400
   c. 400-600
   d. 700+

4. If your school is currently consistently implementing formative assessments, how long?
   a. Not currently implementing
   b. 1-2 years
   c. 3+ years

5. My current role is:
   a. Principal
   b. Teacher
   c. Other

Please provide any further information or comments regarding the implementation of formative assessments.

Appendix B: Teacher Interviews

1. Is formative assessment training available & supported in your district?
2. Have you recognized the impact of formative assessments in your classroom?
3. Do you observe student motivation when implementing formative assessments?
4. Does creating rigorous formative assessments come easily for you?
5. Does implementing formative assessments come easily for you?
6. Do you see the value in implementing formative assessments?

Appendix C: Interview Protocol

a) How extensive is your experience with formative assessments?

b) What is your actual experience when implementing formative assessments?

c) Does your district provide professional development on a regular basis?

d) Are you interested in the development of formative assessment professional development at this time?

e) Has professional development of formative assessments been discussed in your district?

f) Have you had training in the implementation of formative assessments and the impact of formative assessments?

g) Have you seen academic growth when implementing formative assessments?

h) Have you observed motivation in student learning when implementing formative assessments?

i) Have you observed increased academic achievement when implementing formative assessments?

j) Do you feel a personal achievement when observing the success of implementing formative assessments?

Appendix D: Teacher Open-Ended Comments

1. I've observed other teachers who implement formative assessments and their students seem to be excited about learning, but when I tried formative assessments in my classroom, students were not excited about the pause in their assignment.
2. This was one more thing added to my day.
3. I want to try implementing formative assessments, but I feel my district should provide training in this area for me to be successful.
4. Creating formative assessments takes so much time.
5. I recognize the benefits of formative assessments, but I just don't have the time to work these into my daily routine.
6. When implementing formative assessments, I love the climate in the classroom. Students are more focused in the content.
7. There is a definite need for professional development in the area of formative assessments.
8. I wish my administrator would come watch me attempt to implement formative assessments and provide feedback. Would you do this?
9. I do believe if formative assessments were implemented by all in my building the culture of learning would change to be more positive.
10. Do I provide for formative assessments? If so, how do I do this?

11. I have observed my co-teacher implement formative assessments and the entire attitude of the class changes. I mean the students are more engaged and excited about learning. I plan to pattern my attempts after her success.

12. We plan to have a mid-year PD in implementing formative assessments. I will wait to start after that PD.

13. I feel formative assessments will take too much time from the classroom instruction. I barely hit all state requirements now.

14. I think formative assessments are worthwhile and reveal the current knowledge of students, but they take too much time to prepare.

15. I love the versatility of implementing formative assessments and they are useful at any time of instruction.

16. I feel formative assessments support my instruction and help me in deciding where to go with the instruction.

17. I have tried implementing formative assessments and I feel extreme pressure in providing effective feedback.

18. I am excited about this integrative method of improving student motivation in learning. I just do not know how to do this.

19. I know student feedback is important in moving the student forward, to go deeper in content and to challenge the students. I feel I am doing this right now in my classroom.

20. Actually I'm not comfortable providing instructional feedback and helping the student progress. I'm busy teaching.

21. I would really benefit from the implementation of formative assessments and I relish the training. My district needs to do this.

22. I am in the process of being trained to implement formative assessments and I am so excited to try this in my classroom.

23. If my mentor would provide a good example of implementation and guide me, I feel I could do this.

24. I've taught for 12 years and I feel I can do this with a little training.

25. I'm really not sure what formative assessments look like in the classroom.

26. I would call this process an educational investment worth spending time in developing and professional development.

27. I've taught 8 years and I'm willing to do whatever it takes to be the best teacher for my students learning.

28. I have observed the atmosphere becoming more positive sense refining my formative assessments and stronger feedback.

29. Who would have thought that I now need to dig deeper in the content because my students are actually going deeper and farther in the content.

30. The amazing thing about formative assessments is I find my students asking them of other students. When this happens the whole attitude of the classroom changes for the better.